THE MAGIC OF BIRDS

THIRTY-SIXTH
ANNUAL CONVENTION

AFA

August 4th - 7th 2010

ST. PETERSBURG, FLORIDA

AMERICAN FEDERATION OF AVICULTURE

Beyond 'Polly Wants a Cracker'

By Michael Dalton

Many people do not recognize the great intelligence possessed by talking birds. Parrot owners enjoy a bird's occasional comments, but few people note the extent of a parrot's comprehension of human speech. No academic researchers and only a handful of bird owners take interest in voluntary speech by parrots. The macaw, known as Arielle, shows that a parrot can learn human language; part of the evidence derives from the meaningful sentences she constructs based on, but not exactly like, selections from her lessons. Through cognitive language, a tool to investigate the thoughts of another creature, we obtain insight into her mind.

Sources indicate that birds can learn to repeat words, but merely repeating long expressions or individual words is not language. Readers may want to check to see whether they can locate specific information about the linguistic abilities of talking birds. There is hardly any available.

I live with a macaw, a large hook-bill, long tailed, two-pound, tropical bird. The blue and gold macaw (Ara ararauna), called Arielle is my student as well as my instructor in learning about the capabilities of talking birds.

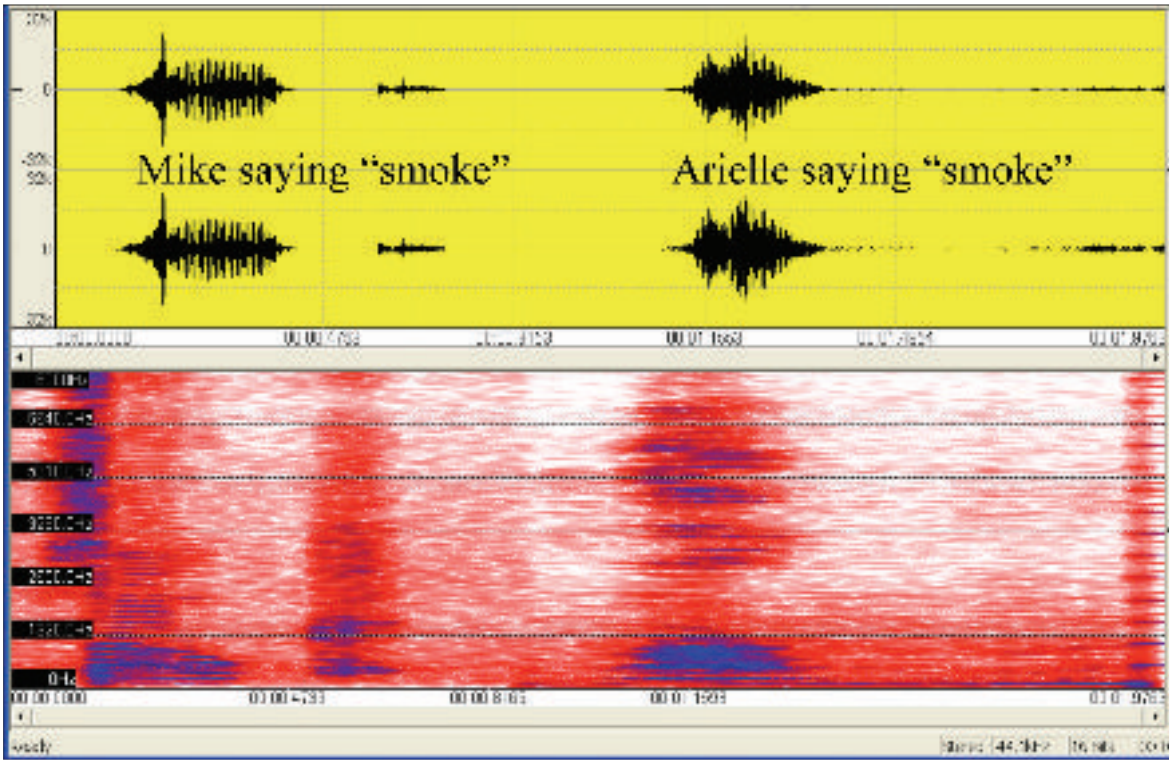
When we listen to a talking bird, we generally hear common things that owners teach their birds, and, consequently, the keepers expect their parrot to say expressions such as "Hi!", "Hello!", "How are you?", and "Polly wants a cracker!" When the parrot deviates from a prescribed script, unless it repeats a phrase many times,

the listener frequently has little idea what the bird said. Many parrots speak in private, but few owners take the opportunity to record their parrot's speech when a bird speaks at a distance. As we will discover, a parrot might be saying a number of unusual, untrained, statements in context.

Many owners find speech by talking birds to be a pleasant diversion. Years ago, as a novice parrot owner, I subscribed to the statement in hobbyist publications, "Parrots only repeat what they hear." My experience after just a few months with Arielle conflicted with what I read and with what bird owners told me, "Birds do not understand the meaning of words."

"How," I thought, "is it possible to know what a parrot does not understand?" As a former experimental scientist, the behavior of my macaw, Arielle, fascinated me and compelled me to investigate her initially baffling ability to use language. Were my experiences with her seemingly knowledgeable speech happenstance or due to learning by the parrot? If my bird were able to learn language, it would be a powerful tool to explore her thoughts. Rudimentary communication between our species would also be possible if she could learn to communicate using meaningful words. I am getting ahead of Arielle's story, so here is a short review of her situation.

Two years before Arielle came to live with us, we adopted a displaced peach-faced lovebird that flew onto school grounds. Speech experiments with the little parrot quickly revealed that most listeners did not understand the lovebird's pronouncements spoken in a distorted high-frequency voice. The situation motivated me to learn more about talking birds and led to purchasing an African grey parrot, we call Louie, Lou for short. As Louie started to speak, I experienced what many bird owners describe as "mumbling" by their birds. I was shocked to find that what we had misheard for weeks as "Hawoo" was not a mispronunciation of the target word "Hello." What Louie was saying clearly was, "Hi Lou!" Looking back, I see these inklings as confirmatory clues that we, human beings, have difficulty correctly decoding our own language spoken by a talking bird. It is not a hearing problem; we run astray in associating the perceived sounds with the corresponding words. Failure by the listener to recognize one or two words can cause complete loss of comprehension for the message! This idea fits in with findings from studies



Sonogram and oscillogram of Mike and Arielle saying the word "Smoke"

of human speech perception in which a similar phenomenon occurs.

Louie learned new words and created some long phrases and complete statements. One unusual instance occurred when he counted backward spontaneously; the demonstration by Lou of a parrot's logical abilities amazed my wife and me. Ornithologists, experts about wild parrots, psychologists, and scientists know very little about the intellectual and linguistic capabilities of different species of talking birds. Common knowledge primarily attributes mimetic speech to parrots. The scant research conducted with talking birds has sought to investigate the cognitive abilities of African grey parrots, but we know nearly nothing about the capabilities of other parrot species. This was a good reason to concentrate my efforts to learn about my macaw's language aptitude.

Louie taught me that humans are likely to have trouble perceiving phrases, other than clichés, spoken by a parrot. My hypothesis is that radio amateurs, musicians, divergent thinkers, and, perhaps, some bird owners have an advantage in interpreting unfamiliar speech by a talking bird. My reasoning is that some "hams" are used to hearing the transfer of high-speed tones when communicating using the Morse code. Musicians might more effectively listen to the sonic components of unfamiliar speech as well as the cadence of a bird's assertions to decode the sounds better than might people without such training. Likewise, divergent thinkers may associate the sound of unusual words spoken by a bird more effectively with the corresponding word or phrase. Limited testing of people over time supports the ideas and my personal experience encompasses each of the factors. An example of the similarity between my speech and one of Arielle's low-frequency voices that is difficult for many listeners to understand appears in the following combined oscillogram and sonogram.

I used the books from a local bird club's excellent library to explore the subject of talking birds, but my experiences did not jibe with the opinions expressed by the authors. I found that Arielle understood more speech than my peers would acknowledge, so I

continued to learn whether a parrot understood language independently. James Audubon (1785-1851) advised, "When the bird and the book disagree, always believe the bird," and, while frustrated, I trusted the experiences Arielle and I shared.

Although most of the volumes in the club library were out of date, one book, dealing with birds other than parrots, changed my life. Howard, an English musicologist, wrote about experiences shortly after WWII. Howard allowed wild songbirds to live in her cottage in rural England where they were safe at night. Each morning she opened the windows to allow the birds to go out to relieve themselves, forage outside, collect nesting material, fly in or out of the house, and live as wild birds do. Birds living in or near her cottage sometimes met her in her fields or garden, because they knew that Howard carried treats when she went outside. She told about experiments with a favored bird in her house using a technique that she termed "close living." Howard's descriptions fascinated me, and I decided to modify her methods for use with my macaw.

Howard described two verbal events that piqued my interest. Her songbirds learned to respond to simple verbal commands in English. In a second task, more closely connected to testing whether a songbird comprehended specific words, she taught a bird to tap out numbers in response to hearing the words associated with a number spoken at random. I interpreted the reports to mean that wild birds could learn English, and, if Howard was correct, I wanted to teach my parrot to comprehend speech. I closed my audio-electronics business and shortly afterward devoted my fulltime to the study of Arielle's linguistic capabilities.

Arielle plays on a jungle gym at a local park.

Before coming to live in our home, Arielle was originally the mighty "queen of the roost" at a local pet store. From her lofty position, I believe that she selected me to be her owner. Arielle drew me to her because she offered me her foot in a friendly manner to mount my arm whenever I entered the shop. It was more than that, and after many years, I still do not understand precisely

how she picked me. Somehow, she sensed that I was a person with whom she wanted to relate or with whom she could relate well. Considering that she was six to nine-months old at the time, it was hard to conceive the intensity of Arielle's personality at such a tender age. Only through future events did I glean insight into the depth of her individual character, which reflects her genetic endowment coupled with the environmental influences affecting her. She adapted to life at our home immediately, as she switched completely from a seed diet to pellets in two days. While she lived at the pet store, I took Arielle for short walks. After two weeks of living together, I began walking around the neighborhood with her perched on my shoulder. Peculiar situations occurred with Arielle. In a rather bizarre occurrence that transpired after two months, she inexplicably named me "*Abba*."

The first word I taught her was "water," which happens to be the breakthrough word learned by the famous blind child, Helen Keller. I held Arielle with one hand as I splashed a long spray of water several times along the surface of our swimming pool for her to see. My actions frightened her. As the water spewed forth a few times, I said, "Look at the water; that is water Arielle," "See the water," and "Arielle drinks water." I randomly reinforced the word a few more times at home. That was the extent of her lesson about water, but a short time later, Arielle unexpectedly rewarded my effort. As we walked by a creek near where we live, I was elated to hear her free-will comment, "Water!" "Yes, you are right Arielle; that is water! You're a good girl," I said. Significantly, Arielle had *transferred* the meaning for the word water from the situation at our pool to the novel circumstance of water in the stream. Her accomplishment shows advanced linguistic capabilities beyond simply repeating the word in response to seeing water at our home (basic associative learning); she showed an ability to *generalize* things into a category containing like objects of that class.

Behaviorists usually motivate animals to perform using a food reward. Because I am in the field a great deal, it is impractical to carry treats everywhere Arielle and I travel. I offer Arielle companionship and verbal encouragement. Her motivation would have to derive from our relationship and an innate desire to learn. No one encourages her to perform or to repeat things on command as one might expect of a parrot who responds predominantly to receive food rewards. My educated macaw and I relate well not only because she is my companion, but also because I treat her as an esteemed colleague.

Based on sporadic reports from parrot owners, I suspected that other talking birds might learn to speak human language appropriately, at least in a few instances. My linguistic quest started after Arielle demonstrated the ability to learn a word and apply it on her own. She had just learned the word water. As we walked down a sidewalk, Arielle became frightened because the sprinklers had irrigated the grass earlier. We saw the evidence in puddles that appeared to hopscotch down the street. I held Arielle as she studied the situation while turning her head upside-down. When she reoriented her head, she leaned forward and said distinctly, "Wet!" It was enough to buckle my knees. I thought about the situation unsuccessfully for about six weeks. One day, I prepared Arielle for a bath, and, as I closed the shower door, I heard the words of my admonition, "Don't be afraid, Arielle; you're going to get wet now." My warning registered a Eureka! moment in my mind; unexpectedly, I had solved the riddle of how she learned "wet," a word that I had not thought to teach her. On her own, Arielle *transferred* the meaning from her experience in the shower at home to the novel situation with the puddles on the sidewalk several blocks away.

The use of words to refer to people, places, and objects is one powerful way that a speaker can demonstrate understanding for the spoken word. More important than notification about an on-the-spot object is the ability of a speaker to *transfer* the meaning of words to similar objects in new or unusual situations.

When a person or bird understands that words convey meaning, a complementary confirmation that the speaker understands references to objects or people comes through using *synonymous* words. Arielle does just that when she refers to herself using different terms including *bird, girl, parrot, Arielle, you, I,* and *me*. She also has several labels for me including the name she gave me, "*Abba*," as well as *he, Mike, you,* and other terms. A surprising sequence of synonyms involves

three sight verbs Arielle put into alignment by saying, "Look!—Peek!—See that!" She learned the verb "peek" on her own from the game "peek-a-boo" that we sometimes play with her cage cover. Extracting the meaning for the verb to peek from the game is an achievement in itself. The untrained array of sight verbs is exceptionally revealing, because the incident corroborates that a parrot perceives dissimilar words fit into a category. Whether it is a single word or a group of words, Arielle makes evident that she learns the meaning of words through lessons and by merely hearing speech in context.

The sequence of sight verbs, spoken as a rapid, impromptu, series do not occur by luck. Arielle's progressions of speech provide evidence of understanding our language and the syntactic elements of language including subject, verb, and object, which when correctly assembled produce a meaningful sentence. Many properly formulated statements from her speech contain terms that fit a category, for example, in one series she said, "Abba, you're Mike. I love you." As in simpler examples, her sequential statements link the synonymous terms Abba, Mike, and you, although the sight verb example is more dramatic. It is unlikely for a human speaker or a nonhuman speaker to put together chains of topical sentences at random. She originates sensible strings of statements with too high a frequency and her assertions are too encompassing for the events to occur by chance.

Arielle relates information in a complex sequence about a package of fruit that arrived at our house. To be fair about the situation, the following series of statements could be Arielle's recollection of a conversation I had with my wife. Arielle has a good memory. However, my wife states emphatically that we never had a conversation corresponding with the macaw's statements, so Arielle likely created the remarkable progression of questions and statements to represent something that the parrot conceived could occur at our house. During Arielle's monologue, she uttered the following slowly articulated series of statements, "Who produced that? – It's an ap'ple – Look at the pac'king – What's the problem with it?" She often speaks about things for which there is no known model. For a parrot learning language, experimenting with different ideas about a common topic using cognitive speech seems reasonable.

An example of a comedic innovation by Arielle was difficult to grasp initially; I understood the words Arielle said, but, unlike some of her more direct jokes, her humor went over my head. Only after many hearings did I recognize the reason my macaw spoke using different intonation. She spoke in two different tonal ranges to simulate a conversation between a supposed person in the street and herself. It is easier to comprehend her straightforward witticism, once one perceives that she is joking. What Arielle said was,

"Does she talk? {low pitch, humanlike voice}

Polly Want(s) a cracker! {normal parrot voice}

Polly Want(s) a cracker! {normal parrot voice}

Good try! {low pitch, humanlike voice}."

I do not say, "Does she talk?" to Arielle, because I address her as Arielle or you, and she has spoken since she came to live with me. She learned the question from people we met along the street. The macaw is proud of her talking ability because I have recorded her answering the posed question with "I can talk." She might answer the question or simply state, unrelated to questioning, "I can talk; I know it!" In this case, she switches to a more recognizable parrot voice before continuing. After saying the most banal expression in her lexicon (Polly want(s) a cracker!) in response to whether she speaks, she counters with "Good try!" in a human sounding voice. It is as if the person said, "You are a stupid bird, because 'Polly wants a cracker!' is not really talking." However, Arielle has the last laugh, because she invented the derisive interchange without a model. Her expressions mock humans in the street who ask whether an intelligent bird can speak. This instance shows that a bird can derive amusement from assembling a series of clever statements as a reaction to what people say in the field.

Arielle identifies a human speaker, in this case my grandson Jackson, by name and tells the listener what the speaker said in verbatim form. The macaw sometimes identifies different people by name, and the subsequent series is particularly interesting because there are markers in the speech that identify the words as those from the little boy she quotes. The five-year old child said, "got" frequently,

and, when unsure about who a person was, he substituted the word "friend" to identify the individual. The boy, from Missouri, visited us over Thanksgiving break, along with other people. The transcription from Arielle's free speech is "'You've *got* a *friend* in the bathroom;' Jackson said that." The bird quotes Jackson's speech, telling what he said, and then she comments impromptu, "Jackson said that." No one had said the phrase to her or encouraged her to respond about the child. The macaw composed the last remark on her own, and she obviously has a good memory for what the boy said, since her statement occurred about three months after he returned home.

As shown by several previous citations, she speaks different strings of topical sentences too frequently for the chains to occur by luck. In order to assemble a series of sentences about a common subject, one has to understand the expressions and the interrelation between the sentences. Arielle is using cognitive language and, like a toddler talking to herself, her meaningful words expose her thoughts.

I previously mentioned synonyms and gave examples including pronoun substitutions. The proper use of pronouns reveals understanding for different linguistic concepts such as viewpoint, special relationships, and understanding of a core being. The process of learning to employ pronouns properly is difficult for young children, so for a bird to master such perspective is a noteworthy feat. Arielle uses pronouns properly and reveals additional information when she says an untutored phrase such as "I'm a pretty, pretty girl." The repetition of the word pretty appears to be her amplification of the characteristic to mean very pretty; very is not a word in her lexicon.

Linguistic analysis of Arielle's speech indicates that she thinks about different matters. Her statements using

Arielle with Jackson

cognitive speech reveal that she is a conscious being, unlike many trained animals that learn to say "I love you" by associative learning through repetition. However, over the years Arielle has shown that she is capable of spontaneously assembling simple sentences. I never modeled an astonishing statement that Arielle made; a dialectician at the University of Georgia, to my delight, decoded the statement without help. I believe the kisses Arielle offers and her many statements reflect her understanding of our relationship. A single untaught and startling expression sums her comprehension; she said simply, "He loves me."

The literature indicates that the ancient Greeks and Romans discovered that parrots could learn human language. Unfortunately, although scholarly investigators cite the historical information in their writing, they have also ignored the information for many centuries. Back in the 1950s, O. Hobart Mowrer concluded that it was necessary to make a parrot a pet if a researcher wanted to get good speech results. For the most part, academic investigators have not heeded his advice, and, to my knowledge, no university investigator studies free speech by a parrot.

Despite the lack of interest at universities, there are, around the world, a number of bird owners, who are curious about what birds say and what one can learn about a bird's thoughts from its speech. There are millions of parrots kept in aviaries and in homes in many countries. The great number of talking birds kept privately highly favors discoveries about the linguistic capabilities of parrots by individual keepers. Interested owners, who live with birds, are likely to be the most dedicated people to determine what parrots are thinking.

The song line "with a little help from my friends" is a good reminder that decoding a bird speaking human words is not an easy task. A two-year old Internet group at Yahoo! called the ParrotSpeech Group explores human language used by parrots. Interested parties may obtain access from Yahoo! or from two pages on Arielle's Internet site: www.ParrotSpeech.com .

One way to gain understanding of an unfamiliar phrase spoken by a parrot is to review its speech. In effect, one must record a bird's speech to evaluate statements by an avian subject through repeated listening. At the start of this article, I described an experience similar to reports by owners of "mumbling" by parrots. A person hears mumbles because the individual's brain has not properly connected the sounds in the "look-up table" of the mind. The thought problem is similar to the gutter at the bowling alley. Once a person's thoughts channel in a particular direction, it is difficult to jump out of the groove to reacquire the words of unaccustomed speech. On the other hand, for some listeners, once they figure out or receive help to understand a few words from a bird's speech, it is much easier to comprehend other messages. It is almost as if one handed the person a key to unlock the words.

Numerous skeptics doubt intelligent speech by talking birds. The vast majority of bird owners have little or no information to counter critical comments about the capabilities of talking birds. We can develop support for the idea that parrots are learning language, if we encourage owners to recognize sensible speech by parrots. The possibilities for communicating with talking birds are plentiful, but some owners might be insensitive to speech by a parrot, or the person might simply lack interest in vocalizations by a talking bird. Many owners are unaware that their birds speak when the keeper is out of the room or away from home. Members of the Internet Group ParrotSpeech are in the process of showing that interested listeners, with help, can learn to perceive the speech of different parrots. Such demonstrations support my position about having to learn how to decode a parrot's voluntary speech. I have transcribed the speech of a bird-at-a-distance several times in the past, and following I offer a challenge for you to hear. My parrot is not the only one that people do not understand; it is talking birds in general. Since they speak our language, we have to improve our listening skills.

The following situation illustrates that even a motivated owner has to develop the ability to decode unfamiliar passages of a talking bird's speech. Laura, a Maryland member of the ParrotSpeech Internet group, adopted a 17-year-old blue and gold macaw named Trixie from a rescue facility. Trixie's speech frustrated her new owner. I anticipated having great difficulty decoding the macaw's speech, because Laura, an experienced bird owner, described the bird's words as particularly challenging to perceive. Nevertheless, I accepted the challenge

to decode Trixie's words. If the project required listening as many as 50 times and required much straining to determine what the macaw meant, I would work at the task. The sounds would not defeat me! In the clip was a particularly vexing single word that perturbed Laura. I planned to transform the sounds electronically, but, upon playing the unmodified recording, my apprehension of the unknown and fear of possible failure at determining an unfamiliar bird's words disappeared. I laughed. Trixie pointedly said, "Ridiculous!" I informed Laura and she wrote back saying, "Well, of course, you are correct. It's very clear. I don't get why I couldn't hear it before." This poignant case illustrates the lack of interspecies English communication between parrots and people is a widespread failing, even among people living with pets.

Because I have spent a good deal of time describing Arielle's speech, it is instructive to take a closer look at speech by another parrot. Barry, an Internet pal, also lives with a blue and gold macaw that he adopted. The macaw, Jack, speaks about different topics. Barry dubbed one recorded session as "Jack_Jabber," probably because Barry is not as fascinated by his macaw's speech as I am. When I listened to Jack's speech, many of his words were quite clear. In isolated instances, he slurred his speech or linked words, which makes any speaker's speech, including that by a macaw, difficult to understand. I have limited information about Jack, but I heard him expressing different ideas using cognitive speech. It is hard to know whether Jack learned his vocabulary from his previous owner, Barry, or by paying attention on his own. An interesting element is that several of Jack's statements feature sequences of multiple–word statements, which are similar to those I find in Arielle's monologues. The importance of this realization is that it supports my idea that parrots across the globe demonstrate a spectrum of competence in learning a human language.

At the 2010 AFA Convention, I twice played a reproduction of Jack speaking, before projecting the

transcription of his statements on the screen for the audience. The clip played twice again as the listeners hear Jack say, "*You're not going to do it for laughs.*" The macaw proceeds to laugh several times, followed by, "*Well, I was just talking about it!—Sooo?*" The statements deal with a single theme with Jack using the word "laugh;" next he simulates the sound of laughter, and then he comments about his statement about laughing. If the word "it" refers to doing something "for laughs" or laughing itself, Jack has appropriately substituted a pronoun to represent a concept. I cannot prove exactly what Jack's intent was, because I have not spent time with the macaw. However, it is evident from his impertinent discourse and simulated laughter that he is having a gay time entertaining himself with knowledgeable speech.

As with speech by a macaw named Jack, replaying utterances by a talking bird over a period allows a person to become more familiar with a parrot's dialect, and one can share the recorded assertions with other people. In the world today, help is just a click away.

Computer enhancement of a bird's words, especially by slowing the rate at which the speech plays can be a major aid to understand what parrots are saying. Many people cannot follow rapid speech by a talking bird because birds can modulate sounds up to ten times faster than a person generally is able to perceive.

Only after many years of working with Arielle did I turn to the history of the investigations conducted with other language-using animals. The studies describing language-using animals were less successful than one would have hoped, perhaps, because the researchers taught the confined animals ineffectively or because the subjects learned a limited number of words. Many of the studies principally investigated an animal's cognitive abilities without intensive effort expended to learn about the language capabilities of the different species of apes or talking birds studied.

Anyone who is interested in the remarkable mental abilities of parrot-like birds might want to read *Another Kind of Mind* about the many characteristics of human language, English, found in Arielle's voluntary speech. I conclude that she has learned our language, and that she has moved beyond "Polly wants a cracker." In our adventure, we have traveled full circle to align with historical accounts by the ancient Greeks noting that parrots can learn to speak and to comprehend human language.

To my knowledge, Arielle is the first modern parrot for whom recorded evidence shows that she possesses human language. Her free speech contains elements that illustrate her understanding for words and the concepts conveyed through speech. The macaw recognizes and identifies people, places, and things employing cognitive speech. She understands the categorical nature of parts of speech, which one verifies by studying her freely spoken statements containing synonyms and independently created variations of phrases. It is nearly impossible to put together series of sentences consistently about various topics if the speaker lacks comprehension for the words spoken. Consequently, innumerable sequential statements freely spoken by Arielle are a profound indicator of her linguistic abilities. From her speech, we learn that a bird can use different pronouns correctly and that she can apply her learning to speak knowingly about intangible concepts. From some of her abstract voluntary statements, it is apparent that Arielle is a conscious being. English, a common language mastered by Arielle, a free-speaking macaw, truly is the window to the mind of another creature.

References/Notes

1 Pickett, J.M., and Pollack, Irwin. "Intelligibility of Excerpts from Fluent Speech: Effects of Rate of Utterance and Duration of Excerpt." Language and Speech, 3 (1963), 151–164.

2 Dalton, Michael. "Spontaneous Counting by an African Grey Parrot." The Grey Play Round Table, Winter 2002, pp. 3–4.

3 I thought than I had discovered meaningful speech by a parrot, but the ancient Greeks and Romans understood that birds could learn human language. Arielle is a contemporary example of a bird understanding human language.

4 Howard, Len. *Birds as Individuals.* London: Readers Union, 1953.

5 The information for this section used with permission from the source: IMa-Bird.com.

6 Mowrer, O. Hobart. *Learning Theory and Personality Dynamics* (Selected Papers). New York: The Ronald Press, 1950. Chapter 24, pp. 688–726.

7 Thorpe, W. H. *Bird-Song: The Biology of Vocal Communication and Expression in Birds.* Cambridge: Cambridge University Press, 1961, p. 122.

8 Dalton, Michael S. *Another Kind of Mind: A Talking Bird Masters English.* Clearwater, Fla.: Arielle Publishing, 2007.

9 Arielle's unusual Internet site provides speech samples for the public to explore as well as other information.