



## *The Alex Foundation Newsletter*

July/August 2006

[www.alexfoundation.org](http://www.alexfoundation.org)

Issue 5, Volume I

### What's Happening in Research

#### Summing it Up - Can Alex Add?

We all know Alex tends to butt into Griff's training sessions, usually by answering for him or occasionally advising Griff to "talk clearly." So, at first, it did not seem unusual when, while conducting an experiment to see if Griffin would count computer-generated auditory clicks, Alex offered his two cents.

Dr. Pepperberg set her computer to two clicks and asked, "Griffin, how many?" When Griffin refused to answer, she repeated the trial. Again, Griffin refused to answer, but this time Alex stepped in with "Four." Being well-versed in Alex's wily ways, Dr. Pepperberg asked him to pipe down and proceeded to repeat the trial for a third time. This time, Alex answered "Six." Was this unsolicited display evidence of addition?

Scientists have long been studying number use in animals such as crows, pigeons, dolphins, and non-human primates in order to gauge how human number use has evolved over time. Most believe our brains are hard-wired to process numerical information. The many similarities between the animal and human brain render competence in number use in animals somewhat unsurprising – but only when the numbers in question are 1-4. More advanced number use, such as the exact counting of numbers above four, has been linked to language and therefore considered uniquely human.



What is the dividing line? Past studies indicate that animals and children three years and under can label a group of up to 4 items by tracking its individual items. When confronted with larger groups of items, a new cognitive process takes over: instead of tracking, subjects estimate whether or not one group is bigger or smaller than another group and subsequently fail to determine how many individual items it contains.

Around age four, the human brain begins to process numbers—likely because of language—differently; we begin to label, track, and order a complex lexicon of words. This process can be said to transfer to numerals, thus making the ability to track and count items in larger groups possible. This is all to say that, historically, 4 has been the divide between human and animal numerical competence.

### Until Alex



Animals like Alex, who have received lifelong training with human speech, and Professors Tetsuro Matsuzawa's and Sally Boysen's chimpanzees, who have been trained to use Arabic numerals, provide a compelling middle ground between animals without such training and children over four. These chimps can use Arabic numbers to identify how many items are in groups of up to 8 or 9 items. Alex produces vocal labels to identify the number of items in groups of up to 6 items, including those with random patterns, novel items and/or varied items. But what about the type of addition Alex displayed during Griffin's auditory response trials?

A past study indicated that one chimp could sum up items in quantities of up to 4 and add and subtract groups of up to 10 tokens. Could Alex, who has an extensive background labeling heterogeneous groups, add a wider array of items? Could he add up to six items? Dr. Pepperberg decided to investigate.

Experimenters in Dr. Pepperberg's lab placed an array of familiar treats (candy hearts, variously sized jelly beans and pieces of nuts) on both the left and right side of a tray. (For example, 3 nuts on the left side and 2 on the right) and covered them with plastic cups. An experimenter then brought the tray over to Alex, lifted the cup on the left side of the tray and then replaced the cup. This action was repeated for the right side.

After Alex had viewed the quantities beneath both cups, the experimenter asked, "How many total?" (For example, "How many nut total?"). In order to produce a correct response, Alex had to remember the quantity under each cup, combine both quantities, and produce a numerical label for the total amount – without any previous training!

Dr. Pepperberg's findings are detailed in her article, "Grey Parrot (*Psittacus erithacus*) Numerical Abilities and Further Experiments on a Zero-like Concept." In her article, Dr. Pepperberg notes that Alex showed "competence in summing small quantities ... independent of the number or type of objects involved ... independent of mass or contour" and "comparable to that of children and young chimpanzees." Notably, Alex is the first non-mammalian species to who has demonstrated summation abilities on par with children and non-human primates.

You may remember back in January when we reported that Alex had spontaneously transferred the meaning of "none" to also indicate the absence of quantity during a number comprehension study. Dr. Pepperberg further explored this "zero-like concept" by randomly including eight trials with no items beneath the cups. Would Alex apply his concept of "none" to this experiment?

Interestingly, Alex refused to answer in five out of eight trials, which is quite different from his usual mode of non-participation (preening, requesting treats, and giving strings of wrong answers). Dr. Pepperberg notes that Alex's "failure to respond suggests that he recognized something was different from the other trials" and that "even if he didn't know what was expected, he knew his standard number answers would not be correct." For Alex, labeling zero as a quantity, or discerning something from nothing, was a challenge. However, his overall response to the task merits further exploration.

Here we see two examples how Alex's spontaneity has taken Dr. Pepperberg's research in new and exciting directions. These fruitful outbursts may be a result of Alex's consistent and diverse training. Have two decades of experience triggered otherwise undeveloped parts of the parrot brain and enabled Alex to process advanced numeric information? When it comes to this amazing bird, anything is possible!

**CONGRATULATIONS** to Dr Irene Pepperberg and co-author Jesse Gordon who are the winners of the Frank A. Beach comparative Psychology Award (Division 6) for their 2005 paper, "Number Comprehension by a Grey Parrot (*Psittacus erithacus*), including a zero-like concept," *Journal of Comparative Psychology*, 119, 197-209. This award is given for the paper that the Editor and Consulting Editors of JCP considered the best in 2005.

## What's Happening in the Lab

We do not have a article this month on lab happenings, but these pictures say a thousand words...enjoy !



Alex's 30th Hatchday

## Dr. Pepperberg's Speaking Schedule

- ✎ August 2-5, 2006. Invited speaker, American Federation of Aviculture, Dallas, TX (open to public w/conference fee)
- ✎ August 2006. Symposium in honor of Dietmar Todt, Berlin (private Festschrift)
- ✎ August, 2006. Symposium co-chair and speaker, IOC, Hamburg, Germany (open to public, but extremely high conference fee)
- ✎ August 27, 2006. Invited speaker, Walnut Creek, CA, Avicultural Society (open to public, details forthcoming)
- ✎ December 2006. Invited speaker, Department of Biology, UCSD (open to the University community)
- ✎ January 12-15, 2007. Invited speaker, Winter Bird Festival, Morro Bay, CA (open to public; please visit the Morro Bay website for more details.  
<http://www.morrobaybirdfestival.org/festlinks.htm>



Even Alex has Embarrassing Moments



Wart Playing Upside-down



Griffin just being cute

## *What's New in Alex's Le Perroquet Gris Boutique*

### *The Alex Foundation Parrot Pens*

This item is so new that we do not even have a picture of them yet on our website yet, but you can still order them. Show that you love parrots and support *The Alex Foundation* by purchasing these fun parrot pens; for a \$12.00 donation you will receive 5 pens. Just go to our gift shop and click on the PayPal link to make your donation, or you may pay by check or money order.



*The Alex Foundation would like to express gratitude to the friends and family of the late Melisse Joi Rosen Shifrin of Columbus, Ohio. Mrs. Shifrin was an avid parrot enthusiast who enjoyed caring for her beloved Eclectus, Yingie, and Cockatiels, Gray C. and Squeegie; as well as being and an active member of the Mid-American Exotic Bird Society. In lieu of flowers, much appreciated donations were made to The Alex Foundation and to the Solon, Ohio chapter of the Parrot Education and Adoption Center in Melisse's memory.*

## What's Happening in Fundraising

### Sponsor of the Month!

The Alex Foundation is still continuing our "Sponsor of the Month" program. We will display your company logo and link on our home page if you become a sponsor. The Alex Foundation also extends private sponsors as well. If you would like more information please e-mail: [alex@alexfoundation.org](mailto:alex@alexfoundation.org)

### Fundraising Item of the Month

Alex celebrated his 30<sup>th</sup> hatchday on June 15<sup>th</sup>, and we are still offering Alex's special edition tee shirt made available by Alex's friend Karla Zimonja.

They are great looking dark heather gray, short-sleeved 100% cotton shirts with an exclusive logo that really captures the likeness of Alex with his sweet, pensive expression and inscribed with "30th hatchday". You can choose either a black or a red logo. The back of the shirt displays the location of our website. Available sizes are women's S, M, and L for only \$20 and women's XL and XXL for only \$22. These shirts are appropriately sized for women, not overly long. Men's t-shirts are also available in sizes M and L for \$20 and XL and XXL for \$22. Shipping is \$4.25 for priority mail.



Each shirt will be individually screen-printed, so please allow a week to ten days after we receive your order. But hurry...these shirts will only be available for a limited time. This is a must-have item, and you can feel good about supporting Alex as he enters his third decade...just consider it a birthday gift! All proceeds from sales of these beautiful shirts will be kindly donated to The Alex Foundation. To order, simply send us a check or money order, or visit the gift section of the website to utilize PayPal.

Contributions to *The Alex Foundation* can be made on Alex's website, [www.alexfoundation.org](http://www.alexfoundation.org), or by sending a check or money order to the address below:

*The Alex Foundation*  
Brandeis University  
Department of Psychology, MS-062  
Attn: A. Levin  
415 South Street  
Waltham, MA 02454

Some firms offer a corporate-matching program. If you are employed by a company that matches employee donations, your contribution to *The Alex Foundation* can do twice as much good. All contributions to *The Alex Foundation*, a non-profit 501c.(3) organization, are tax deductible

## In the News



The links below are to recent newspaper articles from the London Sunday Times, The Australian News, and ABC News Online.

[http://www.timesonline.co.uk/article/0,,2087-2272517\\_1,00.html](http://www.timesonline.co.uk/article/0,,2087-2272517_1,00.html)

<http://www.theaustralian.news.com.au/story/0,20867,19812209-30417,00.html>

The ABC article is a phone interview by ABC's Australian affiliate, "The World Today"; there is also an audio link on their website. **Note:** The picture that is used in the story is a file photo (Reuters) and is **not** Alex or any of the parrots in the Pepperberg Lab.

<http://abc.net.au/news/newsitems/200607/s1693309.htm>

*The Alex Foundation would like to extend our condolences to Jaimi Torok on the loss of her beloved Timneh Grey Parrot "Tico". Jaimi volunteered many hours working on our website.*

*Tico will live in your heart forever...*



Tico  
July 22, 2006