



# Serial TrHacking

## Learning in African Grey Parrots



Pigeons can perform impressive feats when trained with classical chaining. But these apparently sophisticated performances diminish in accuracy if the context changes or the chained behavior is interrupted. Pigeons cannot easily start chaining in the middle of the sequence, omit steps, or modify the chained sequence to adapt to new conditions (Straub & Terrace, 1981).

We are studying whether African Grey Parrots can transfer serial learning from an initial context to new contexts with minimal retraining, and acquire knowledge beyond simple stimulus-response. This experiment appears similar to classic operant-conditioning studies, but differs in the expectation these birds will be able to adapt learned principles of motion correspondence from one context to a novel context.



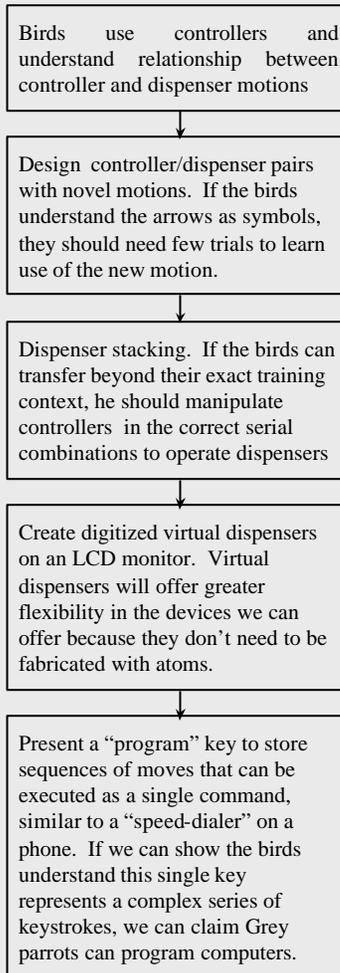
Pull

Flip

Rotate



### Experimental Timeline



### Experimental Issues

This experiment is in development and many issues are still being resolved:

- **Motivation:** Unlike subjects in traditional animal behavior experiments, our birds are well-fed and have continual access to food. Incorrect selections do not result in electrical shocks, food deprivation, or any other social or physical consequence beyond a delay in further access to the device. We are experimenting with locking out the controller after an incorrect motion, but this type of variable reinforcement could actually strengthen the behavior.
- **Playfulness:** The birds often seems to treat the apparatus as a playful "busybox" rather than an experimental apparatus. Anecdotally, we feel he understands the relationship between the controls and dispensers, yet sometimes chooses to do the wrong thing. On several occasions he consistently activated one of the two incorrect controllers until an additional almond was added to the correct dispenser. Wart then immediately activated the correct controller.
- **Clean Motions:** Because the controller can be pulled, flipped, and rotated simultaneously, the birds quickly learn the most efficient means of obtaining food is to perform all three motions simultaneously. To deter this behavior, we only activate the dispenser corresponding to the dominant controller motion. This forces the birds to be cleaner with their motions.
- **Communication:** Wart often seems to activate empty controllers to get our attention or protest undesirable food choices. In other words, Wart may be using the experimental apparatus to communicate with us.
- **Thresholding:** The original dispensers activated only after the controller position reached a threshold. We are now using continuous motion -- small movements in the controller lead to small motions of the dispenser.