

Animal Language Programming and the Scientific Bird Flock:

A Pre-Experimental Investigation into AI-Mediated Transmission of Inquiry Workflows in Vocal-Learning Birds

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January 28, 2026

Keywords: Animal Language Programming, Bioacoustics, Vocal Learning, Social Learning, AI-Mediated Communication, Interspecies Inquiry, Ethology.

Abstract

Recent advances in Natural Language Processing and Natural Language Programming demonstrate that language can function as an executable control interface rather than merely a representational medium. This proposal introduces Animal Language Programming (ALP): the hypothesis that structured behavioral workflows can be transmitted to animals using species-specific vocal and bodily signals, mediated by artificial intelligence. We propose a controlled study testing whether ritualized vocal sequences representing an inquiry-like workflow (“explore → test → persist → signal”) can improve exploration efficiency and task persistence in parrots and corvids. This study explicitly focuses on behavioral dynamics and social transmission, laying the groundwork for the “Scientific Bird Flock.”

1 Background and Rationale

1.1 From Language Processing to Language Programming

Natural Language Programming reframes language as a mechanism for executing workflows. This is particularly relevant to non-human animals, whose cognition is primarily procedural. If an AI can generate a vocal sequence that triggers a specific behavioral mode (e.g., “persistent exploration”), it effectively programs a workflow into the biological agent.

1.2 Animal Communication and Social Learning

Vocal-learning birds (e.g., *Psittacus erithacus*, *Corvus moneduloides*) demonstrate imitative learning and context-dependent use of calls. These properties suggest that animal communication systems function as behavioral control channels.

2 Hypotheses

- **H1 (Primary):** Birds exposed to structured, ritualized vocal sequences associated with exploratory tasks will demonstrate increased exploration efficiency compared to control groups.
- **H2:** Exposed birds will show statistically significant improvements in error recovery latency and task persistence.
- **H3:** Behavioral effects will propagate to naïve birds via social learning mechanisms, measured through network diffusion modeling.

3 Methodology

3.1 Subjects and Housing

- **Species:** African Grey parrots (*Psittacus erithacus*) and New Caledonian crows (*Corvus moneduloides*).
- **Sample Size:** $n = 12$ per species, split into Experimental and Control groups.
- **Ethics:** Research conducted in enriched, non-coercive environments following institutional ethics board (IRB/IACUC) approval.

3.2 Experimental Design

The study utilizes a multi-step foraging task requiring three distinct phases: initial exploration, trial-and-error, and social signaling upon success. The Experimental group is paired with a “Workflow Signal”—an AI-generated, species-appropriate ritualized vocal sequence played via high-fidelity speakers during the task.

4 AI System Role and Modeling

The AI system acts as a closed-loop behavioral optimizer. It analyzes baseline bioacoustic data to ensure generated signals remain within the species’ phonetic repertoire while introducing novel temporal structures that correspond to the proposed inquiry workflow.

5 Ethical Considerations

Participation is strictly non-coercive. No food deprivation or aversive conditioning is utilized. The study is designed to provide cognitive enrichment, potentially improving the well-being of captive subjects by introducing complex, successful problem-solving frameworks.

6 AI Assistance Disclosure

This proposal was developed with the assistance of the Gemini 2.5 Flash model. The AI assisted in the structural organization, bioacoustic terminology refinement, and the synthesis of Natural Language Programming theories with ethological frameworks.

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