CHI 2024 Papers - submission 3682

Comments to Authors

(none)

contact : Jennifer Cunha (jen.cunha@gmail.com)

Polly Talks About the Weather: Toward Evaluating the Expressive and Enrichment Potential of a Tablet-Based Speech Board in a single Goffin's Cockatoo

Abstract

Augmentative and alternative communication (AAC) is designed to assist humans with complex communication needs. Recently, AAC use has been reported in non-human animals. Such tools could improve social and cognitive enrichment, agency and control, and potentially interspecies communication. However, there is no evaluation framework and little data available to assess AAC potential. Here, we examine seven months of a parrot's sustained use of a tablet-based AAC totaling over 129 sessions within a window of 190 days. After creating an evaluation framework, we explored the expressive potential and enrichment value for the parrot. Our results suggest that the choice of destination words cannot be simply explained based on random selection, visual salience, or icon location alone, and 92% of corroborable selections are validated by behavior. The parrot interactions were significantly skewed toward social and cognitive enrichment, indicating high potential value. This work is a first step toward AAC enrichment with parrots.

Authors

Dr. Jennifer Cunha
College of Art, Media and Design, Northeastern University, Boston, Massachusetts, United States, j.cunha@
Parrot Kindergarten, Jupiter, Florida, United States
Corinne C Renguette
Indiana University at Purdue University in Indianapolis, Indianapolis, Indiana, United States, crenguet@iupui.edu

Nikhil Singh
MIT Media Lab, Massachusetts Institute of Technology, Cambridge, Massachusetts, United States, nsingh1@mit.edu
Lily Stella
Indiana University at Purdue University in Indianapolis, Indianapolis, Indiana, United States, lstella@iu.edu
Megan McMahon
Northeastern University, Boston, Massachusetts, United States, mcmahon.me@northeastern.edu
Hao Jin
Northeastern University, Boston, Massachusetts, United States, jin.ha@northeastern.edu
Pr. Rebecca Kleinberger
College of Art, Media, & Design, Northeastern University, Boston, Massachusetts, United States, r.kleinberger@northeastern.edu

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Paper Length

Standard Paper (5,000-12,000 words, average 7,000-8,000)

Length Justification

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Accessibility of Figures / Alternative Text for All Figures and Tables

Figure 1: “The session was set up with the parrot on a stand and the tablet arranged such that the caretaker could not see the selections being made”
Figure 2: “An example of the AAC system, this one is with the Main Menu, the "To Play" menu, and the "Temp and Weather" menu"
Figure 3: “Tree architecture of the AAC system showing the different layers and depth of menus and destination words”
Figure 4: “The parrot was invited to touch a treat icon for a treat reward, then a

second treat icon for a second treat reward. Then the parrot was asked to select the proffered treat icon in a discrimination task, and finally was asked, "Which is your favorite?" and given whichever treat she selected"
Figure 5: “Histograms of observed vs. simulated button press rate distributions. All three simulated datasets partially reproduce different attributes of the observed distribution, such as a bias towards low rates (all), the bounds of the bulk of the distribution (+Leafs, +Abandon), and the skew towards near-zero rates (Random). However, the observed distribution still differs from these in the specific skew, and the long tail with outlier buttons”
Figure 6: “Estimated Marginal Mean (EMM) rates for button presses by button XY position and dataset (observed vs. the three simulations). Though in some cases the simulations are close to the observed rates, several significant differences remain. * indicates p<0.05, ** shows p<0.01, and *** shows p<0.001. Overall, the observed behavior deviates from all simulations, suggesting factors beyond the interface structure may play a role in determining observed behavior"
Figure 7: “Corroboration outcomes are seen here with C1 - Engagement with Food/Beverages and C2 - time-on-task with Socio-Cognitive Activity as well as instances in which the parrot did not corroborate. The parrot corroborated either with engagement or time-on-task 92% of the time across 492 corroborable tasks”
Figure 8: “This is the distribution of categories of the icons selected by the parrot."
Figure 9: “Three major themes emerged from Polly's selections - Socio-cognitive, Food/Beverage/Treat and Environmental Information. Despite a distribution of 56.7\% for Socio-Cognitive on her AAC device, Polly selected these icons 72.5% of the time”
Figure 10: “Three major themes emerged from Polly's selections - Socio-cognitive, Food/Beverage/Treat and Environmental Information. Despite a distribution of 56.7\% for Socio-Cognitive on her AAC device, Polly selected these icons 72.5\% of the time. Food/Beverage/Treat was selected in a similar proportion to the icons on her AAC device, but she selected Environmental Information at a much lower rate than the distribution available on the AAC device."

Applicable Ethics Review Requirements

University ethics exempted IACUC due to private ownership

Anonymity Check

I verify that this submission is correctly anonymized.

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Clara Mancini, Expert in Animal-Computer Interaction and founder of the field, clara.mancini@open.ac.uk https://scholar.google.com/citations?user=xMeAg1cAAAAJ&hl=en&oi=ao

Charlotte Robinson, Expert in Animal-Computer Interaction and developing systems for pets, Charlotte.Robinson@sussex.ac.uk https://scholar.google.com/citations?user=-V6o9kEAAAAJ&hl=en&oi=ao

Irene Pepperberg, Expert in Avian Cognition and Animal-Computer Interaction and studying symbol learning in parrots, impepper@media.mit.edu https://pubmed.ncbi.nlm.nih.gov/29528667/

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Jennifer Cunha
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Response to Reviewers and Summary of Changes

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