Do environmental conditions affect personality traits in Poison Dart Frog (*Dendrobates auratus*)?

Brogan Loughlin, Luiza F Passos

School of Psychology and Natural Sciences, Liverpool John Moores University.

Introduction:

There has been an increase on research centred on the proposition that animals can alter their behaviour to better cope with the environmental conditions through their lifetime. These changes can lead to individual differences in behaviour that are significantly relevant to conservation, in terms of anti-predator, exploratory and risk-taking behaviour. The captive environment is widely different from any wild habitat, if animals are being kept for conservation, it is imperative to consider how housing conditions can affect their behaviour and personality. The aim of this study was to understand the effect of environmental conditions on personality traits of *Dendrobates auratus.*

Methodology:

A group of frogs was kept under basic standard conditions and a second group under environmental enriched conditions; different live plants, caves, hiding spots. During the length of the experiment, no alterations were made to the standard conditions group, while the enriched groups had changes made to their enclosure every 3 weeks. Standardised arena trials were used to test exploratory and risk-taking behaviour on both experimental groups.

Exploratory trial:

Four equally-spaced shelters were placed in a arena, allowing shelter seeking. High activity levels were associated with exploration. Frogs were placed under a shelter in the centre for two minutes. The total distance each frog moved was measured (mm) and the total time a toad spent in shelter (s). Animals were observed for 20min

Risk taking trial:

The same arena set up was used with the four shelters removed and two artificial rocks were placed into the arena instead, and silver tassel material hanging from the wall behind the rocks to provide visual novelty. A shelter was placed in the middle of the arena .

Results:

The results from the exploratory trial show that there was a significant difference in the mean distance travelled ($p<0.05$), with non-enriched travelling longer distances (Figure 1). The results from the risk taking trial show there was a significant difference ($p<0.01$) in the time interacting with the novel object, with non-enriched interacting more.

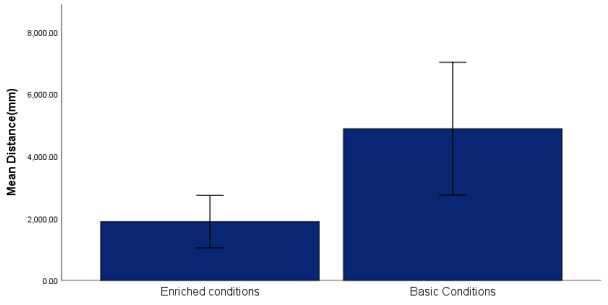

Figure 1. Mean distance travelled by enriched and basic conditions group during exploratory trials

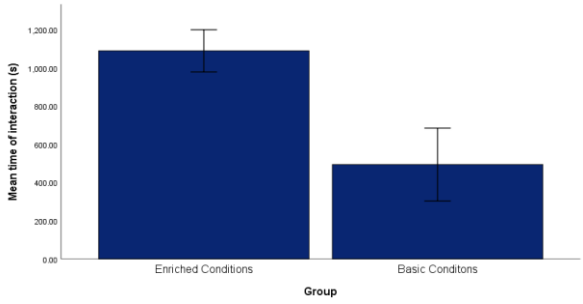

Figure 2. Mean time of interaction with novel object by enriched and basic conditions group during risk taking trials

Discussion:

Contrast to what was predicted, *D.auratus* individuals from the non-enriched conditions showed higher levels of exploratory behaviour, moving greater distances and spent less time seeking shelter. Those individuals were also quicker to emerge from shelter and were quicker to approach the novel object in the arena.

The difference support the idea that environmental conditions can alter behaviour and personality in captive animals. If animals are being kept for conservation and future reintroduction, it is imperative that the appropriate environment is provided to better shape the individual's behaviour. Studies have shown that bolder and more exploratory animals have a lower survivorship during reintroduction programmes. Therefore, it can be believed that the personality tests like the ones presented here could be used to evaluate the quality of the environment conditions and as a tool for selection and preparation of animals for release.