Investigation into Guppy Intelligence

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Lucy Sudekum and Colin Townes-Anderson
Bio 342 Reed College

Guppy (*Poecillia reticulata*) Intelligence?

• Previous studies show increased female preference for males with quick learning ability

• Ability to learn correlates with male foraging ability

• Learning = Foraging = Increased Fitness in offspring

The Test

Male guppies tested in maze with food as incentive!
Experimental Design

• Guppies run through maze over 8 day period with dish of bloodworms at end of maze
• Guppies given 5 minutes to acclimate in tank with a divider blocking entrance to maze
• Guppies given 10 minutes to run maze
• After 10 minutes, guppies led through maze with net.
• Maze set up based on Shohet (2009) design

Tests conducted over 7 consecutive days
• Guppies labeled 1-8
• Guppy order randomized each day
• Guppies starved 24 hours before start of testing
• Bloodworms placed in plastic dish at end of maze

Figure 4. Maze design with measurements, gray circle with red lines depicting bloodworm dish. Guppy photo from: http://fins.actwin.com/species/index.php?t=9&l=183
### Results and Data Analysis

<table>
<thead>
<tr>
<th>Guppy Number</th>
<th>Avg. Time in Maze (sec)</th>
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<tbody>
<tr>
<td>1</td>
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<tr>
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<td>600</td>
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<tr>
<td>8</td>
<td>570</td>
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</tbody>
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Figure 1. Average time of each guppy. Only half the guppies during tests completed the maze.

Figure 2. Time of each guppy over the 7 runs.

Figure 3. Number of guppies that found food over each run. With a logistic regression test, found that there was no significance during which day the guppies were tested (P-Value= 0.2, Slope= 0.25, Std. Error= .2).
Discussion

Was it food type, how guppies learned the maze, or distractions?

Potential Solutions:
- Flake food vs. Bloodworms
- Increased run time?
- Mirror for observation!

Selected References


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