How does color affect fish feeding behavior?

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Introduction

- ➔ Archerfish can recognize human faces[2].
- ➔ There have been many studies that show that fish can identify specific things from their surroundings and correlate it to certain actions[1].
- ➔ We decided to test color, instead of human faces, with fish identification based off of White's study.

Hypotheses

Initial - The fish will spend more time in a three inch radius of the red color than the yellow color.

Alternative - The fish will spend more time in a three inch radius of the yellow color than the red color.

Null - There is no difference in the amount of time the fish will spend in a three inch radius of the red or yellow color.

Variables

Independent - amount of food given
Dependent- number of times the fish swim within a three inch radius of the two colors
Control - water quality, amount of food fed, light exposure, consistency of feeder

Figure 1: Hemichromis
We tested with one of this species

Figure 2: Frontosa Cichlid
We tested with two subjects of this species

Methods

Phase 1

1. We presented the fish the red color during feeding for one week.
2. We put up a red file folder on the outside of the tank and a popsicle stick with a red square attached to it in the inside of the tank until the fish finished feeding.

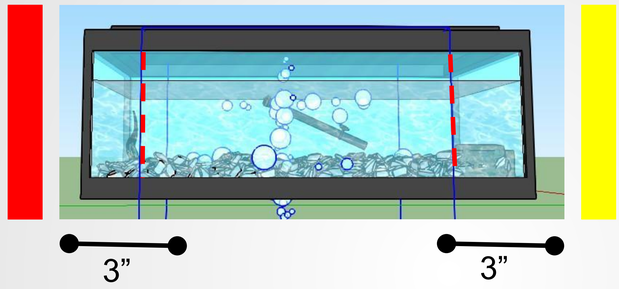

Figure 3: SketchUp Model of conducting the experiment

Phase 2

1. We put up the yellow and the red file folder on the outside of the tank.
2. Both popsicle sticks were inserted on their corresponding sides. The red popsicle stick was dipped in flake feed for the first two tests.
3. The following two tests, the red popsicle stick was inserted into the tank on its own.
4. With each test, we counted how many times each fish swam within a three inch radius of the two colors.

1. Ockerman, Emma. "Fish Can Recognize Faces, Study Shows." *Time*, Time, 8 June 2016, time.com/4361207/archerfish-can-recognize-faces-study/.
2. White, Jamie K. "Fish can recognize human faces, study shows." *CNN*, Cable News Network, 7 June 2016, www.cnn.com/2016/06/07/health/fish-human-face-recognition-study-trnd/index.html.

Results

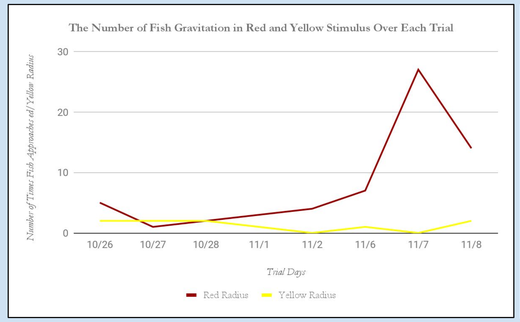

Figure 4: The number of times each fish gravitated toward the red color and yellow color in each trial day.

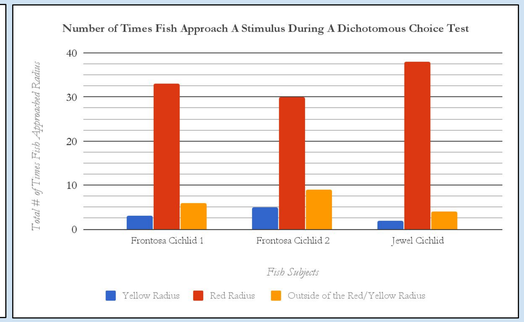

Figure 5: The number of times fish approach a stimulus during the tests.

Discussion

- ➔ After associating the red color during feeding for one week, we started our experiment. The fish gravitated towards the red color a total of 101 times all together. The total gravitation in the yellow color was 10 times.
- ➔ Our data supports our initial hypothesis because the fish swam within a three inch radius of the red color more than the yellow color.
- ➔ Some potential confounding variables that may have impacted the experiment include:

- ◆ Temperature (not measured)
- ◆ Change in fish numbers
  - Deaths and necessary acclimation
- ◆ Light
  - Light effects color visibility underwater for fish
- ◆ Inconsistent time of feeding
- ◆ Human visibility
  - Making sure we associate the red color when feeding not ourselves

- ➔ New questions that arose from conducting this experiment include:
  - How does human visibility and light affect fish feeding behavior?
  - Does time of day affect fish feeding behavior? If so, how?
- ◆ We could test by controlling the visibility of the human being to the fish, the wavelengths of light, and time of day during feeding.