

Terror in the Tank!

Predation Effect and Mate Choice Reversal in *Poecilia Reticulata*

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Female guppies have been shown to reverse their preference for flashy males in the presence of a predator⁽¹⁾. We seek to explore the possibility of “overriding” this reversal with exceptionally flashy males⁽²⁾.

The guppy, *Poecilia reticulata*...

- is a common freshwater fish native to the Caribbean
- exhibits sexual dimorphism
- females show preference for “flashier,” colorful males
- has a wide range of “flashiness” between individuals



(b)



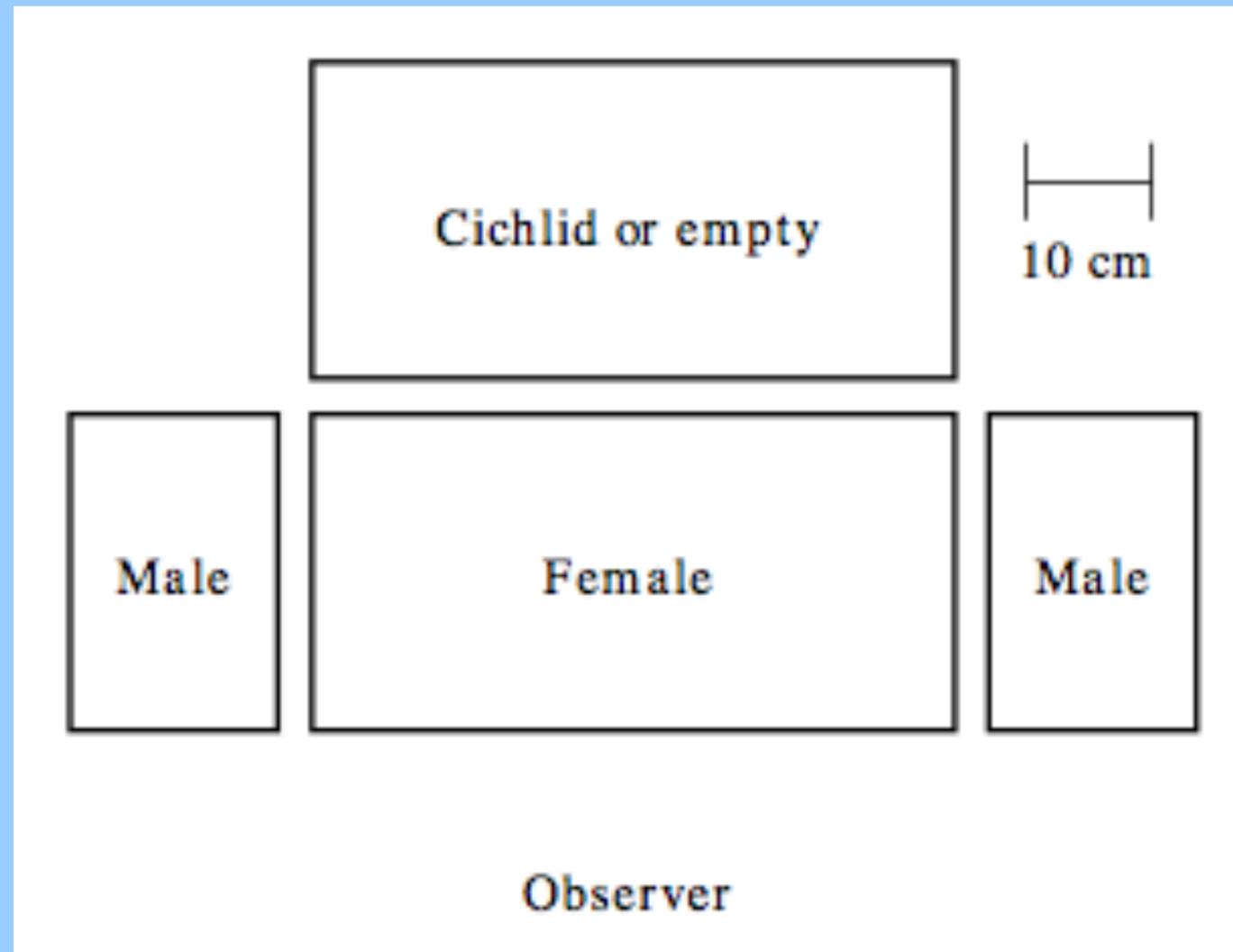
(a)

The cichlid (*Astatotilapia burtoni*)...

- is a natural predator of the guppy

Experimental Design:

Hypothesis: Sufficiently flashy males will be able to “override” or lessen the effect of visual exposure to a predator in female guppies



- Female preference was measured in 10 minute trials before and after visual exposure to a predator as total time spent in proximity (10 cm) to adjacent tanks housing flashy vs. drab males.
- Male flashiness was scored subjectively. The scores of 5 separate judges were averaged to produce the hierarchy used in trials.
- As a control, trials were run with the female exposed to an empty cichlid tank.

(1)

Figure 1. Experimental apparatus, indicating 4 separate tanks each housing a single fish. Opaque black dividers were used to conceal selected fish from each other during and in between trials.

Results:

- For each trial, data were calculated as:
 $\log_{10}(\text{total time spent near flashy male}) / [\text{total time spent near drab male}]$.
 - Positive values indicate preference for flashy males, negative values indicate preference for drab males.
- Data were nonparametric; Sign Test was used, and we determined that there was no significant difference between pre- and post- predator exposure behavior ($x=4$, $N=9$, $p=0.5$)

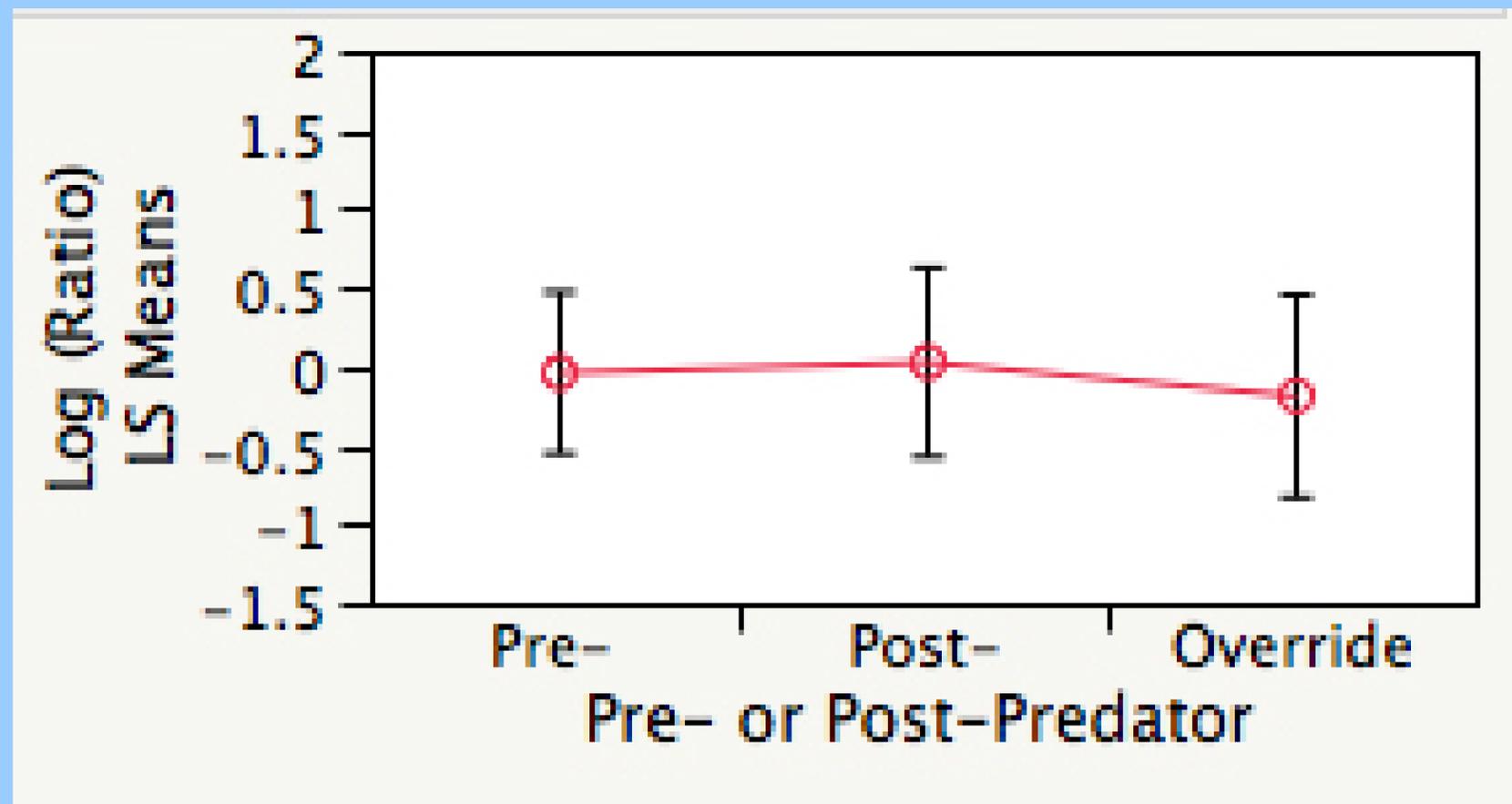
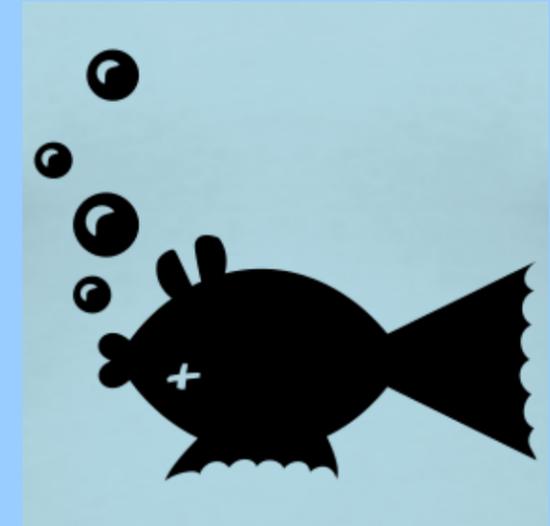


Figure 2. Mean of log(ratio of time spent near flashy male to time spent near drab male) for each trial type.

Conclusions:

Our data fails to display any predation effect or override thereof.



(c)

Future Directions:

- A different selection of males / More easily differentiated in terms of flashiness
- A different, more indirect method of monitoring trials (minimize experimenter artifact)
 - Observer presence may have caused a separate predation effect, eliminating validity of female mate-choice preference.

References:

- (1) Gong, Anson and Robert Gibson. "Reversal of a female preference after visual exposure to a predator in the guppy, *Poecilia Reticulata*." *Animal Behavior*. 52 (1996): 1007-1015.
- (2) Dugatkin, Lee and Jean-Guy Godin. "Reversal of female mate choice by copying in the guppy (*Poecilia reticulata*)."
Proceedings: Biological Sciences. 249.1325 (1992): 179-184.

Images:

- (a) <http://badmanstropicalfish.com/livebearers/ElectricBoy2a.jpg>
- (b) <http://www.gopetsamerica.com/fish/pics/astatotilapia-burtoni-1.jpg>
- (c) http://image.spreadshirt.com/image-server/image/composition/16553461/view/1/producttypecolor/3/type/png/width/280/height/280/sky-fish-belly-up-1c-tanks_design.png

Acknowledgements:

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