

# Is Beauty Only Skin Deep? Mate Selection in Guppies

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## Introduction

Our experiment sought to understand mate preference in female guppies, *Poecilia reticulata*. We observed behavioral differences between wild-type males caught from a local indoor pond and vibrant pet store males, who exhibited higher stress levels, likely due in part to being shipped long distances. Observing these behavioral differences, we hypothesized that females would prefer the less stressed males regardless of color. When a female guppy was presented with both a wild type and a pet store male, we predicted that she would prefer the wild-type male on account of their lower stress.

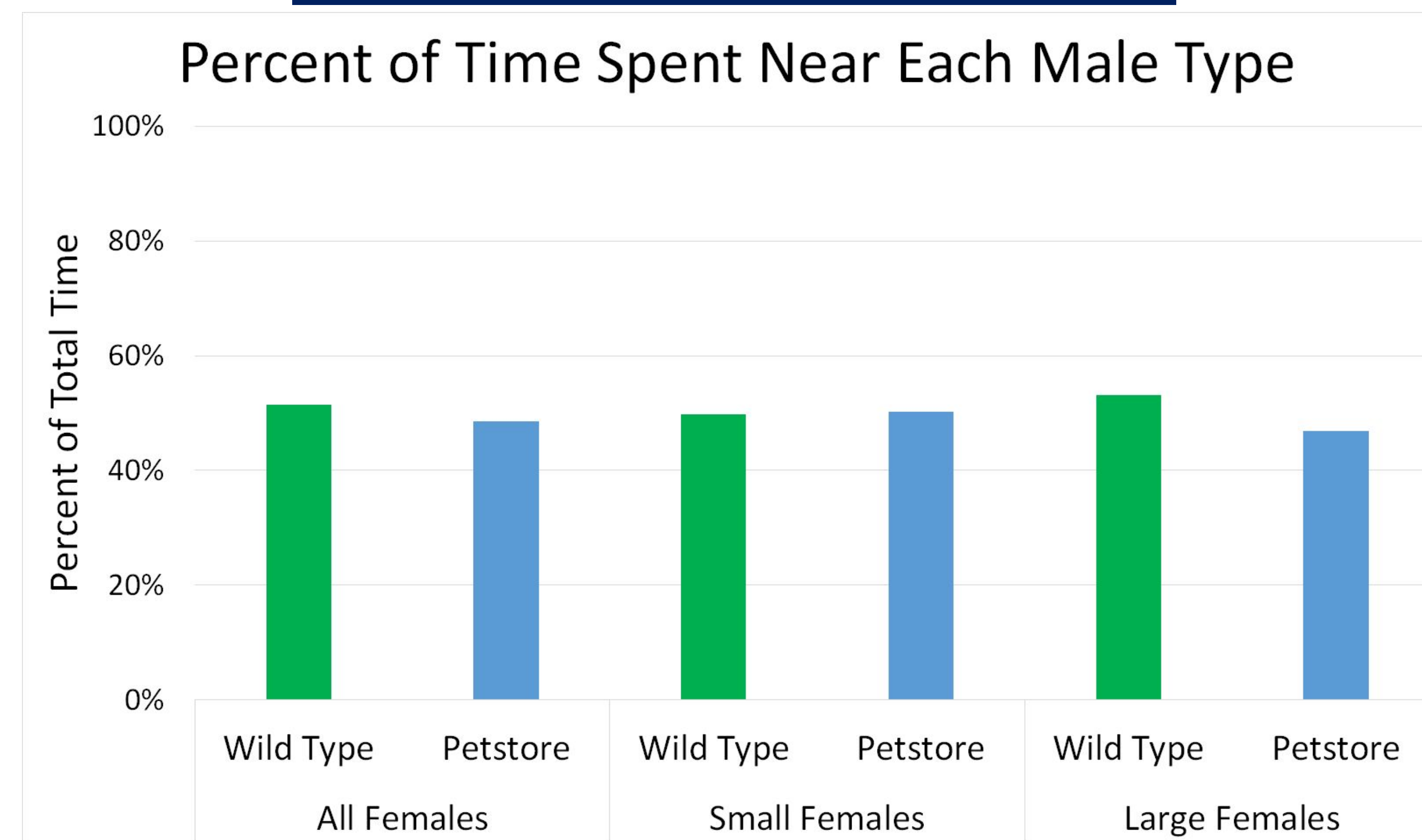
## Methods

- A tank was divided into 3 equal sections by panes of glass.
- Each female was placed in the center section. A pet store male was placed on one side, and a wild type male on the other. We waited 2 minutes to allow the fish to acclimate.
- Total time spent on each side of tank by the female was measured over 2 minutes.
- The process was then repeated, with the same males on opposite sides.
- Females were lastly weighed in a separate container and returned to holding tanks.



**Figure 1.** Test tank with female in middle, wild type male on left and pet store male on right.

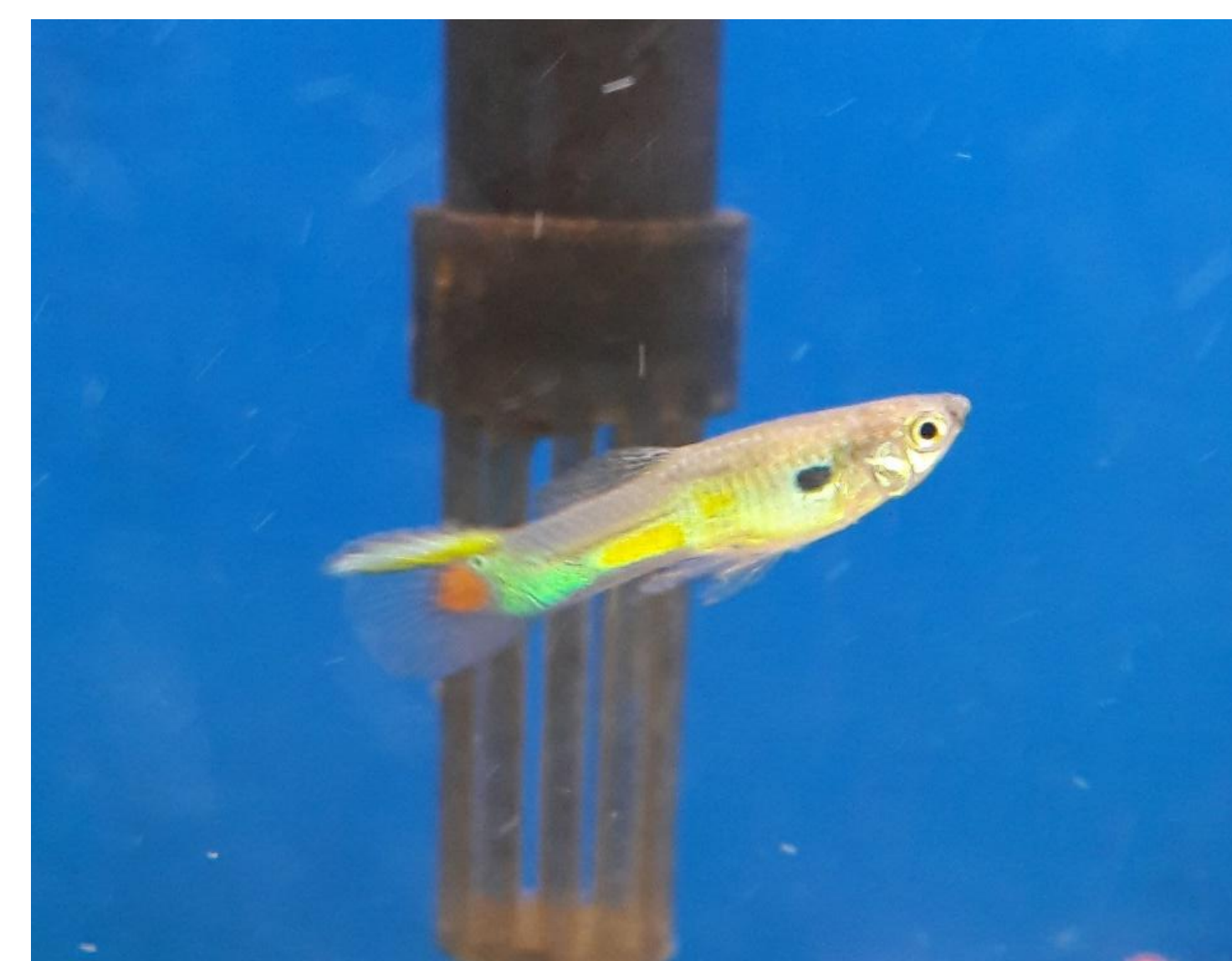
## Results



**Figure 2.** Female guppy preference, by weight, for male guppy types. P-values: **0.66** (All females), **0.28** (Small females), **0.79** (Large females).



Petstore Male Guppies



Wild Type Male Guppies



**Figure 3.** Photo samples of guppies used in our experiment. The top left shows pet store males, top right a wild type male, and below, females collected from the same pond as the wild-type males.

## Conclusions

- Female guppies had a slight preference for wild type males over pet store males. However, after performing a paired T-test, it was found that this preference was not statistically significant. Interestingly, while not statistically significant, stronger preference for wild type males was shown by older females weighing over 2 grams at 6.34% more time spent near wild type males. While younger females weighing less than 2 grams showed no preference between male types.
- This slight preference may not necessarily indicate that females prefer these wild type males as a result of lower stress levels. However, the higher preference for wild type males by females over 2 grams may indicate that females older with more somatic resources prefer wild type males. It cannot be conclusively stated that this preference results from lower stress levels in these males over the more vibrant pet store males.
- Further testing is needed to determine if the slight preference for wild type males results from lower stress levels or if there are other factors that may influence female choice. Additional testing will also be needed to quantify male stress levels in order to determine if this is a significant factor for female choice.

## Acknowledgements

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