

Mood Lighting: Can Orange or Yellow Filters Make Male Guppies Sexier?

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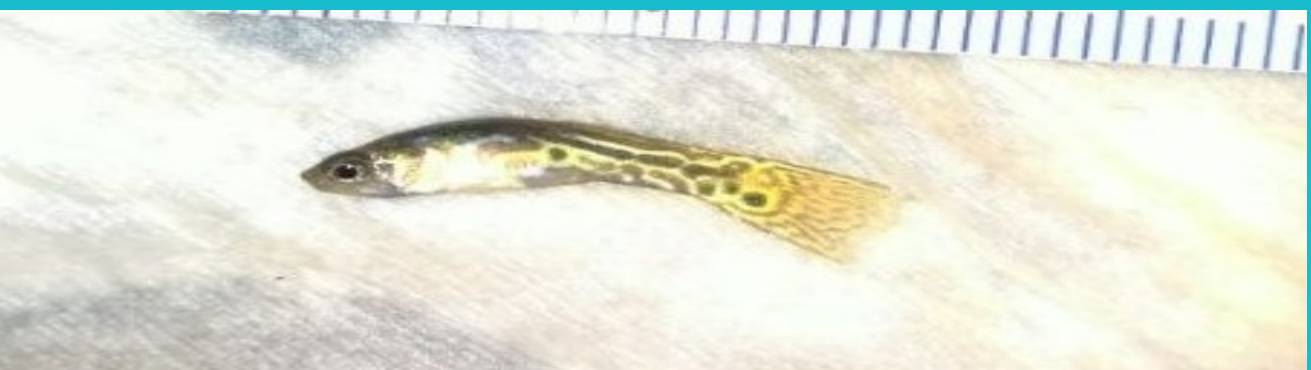
Bio 342

Introduction:

Female guppies, *Poecilia reticulata*, choose mates with the largest and brightest orange spots. Is there such thing as too much orange? We explore female mate choice when orange or yellow filters are placed over male guppies. We expected that males behind an orange filter would be considered sexier by female guppies, while males behind a yellow filter would be less attractive.



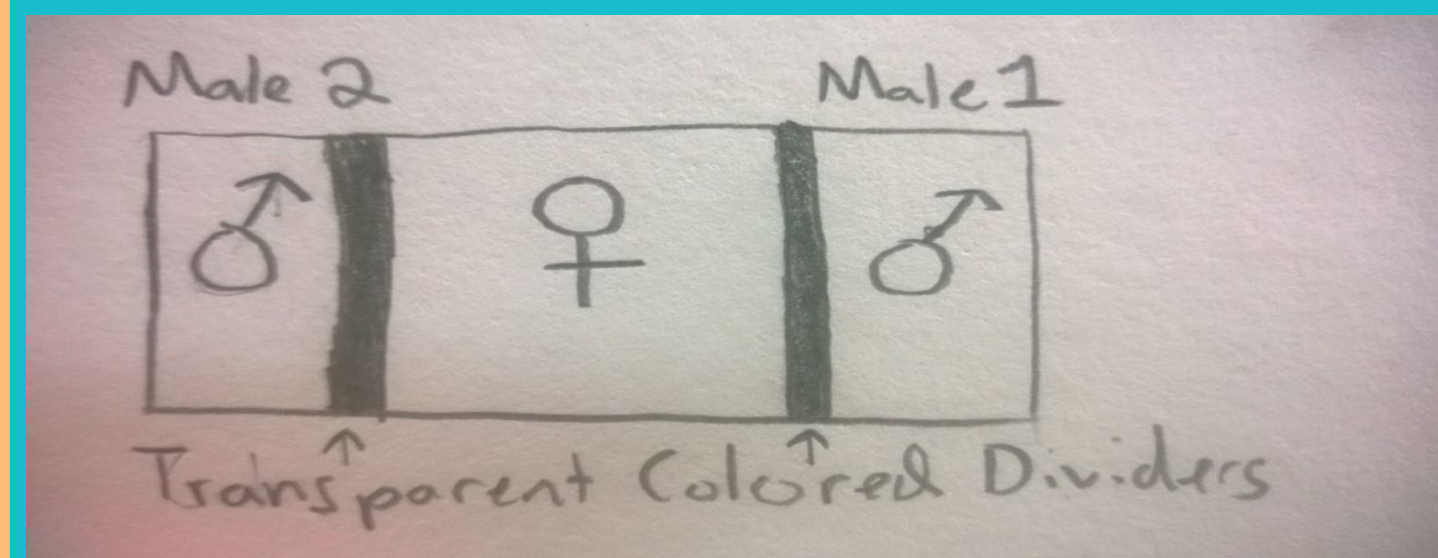
Sexy Male with Orange Spots (Male 1)



Not a Sexy Male (Male 2)

Methods:

Top View of Tank Setup:



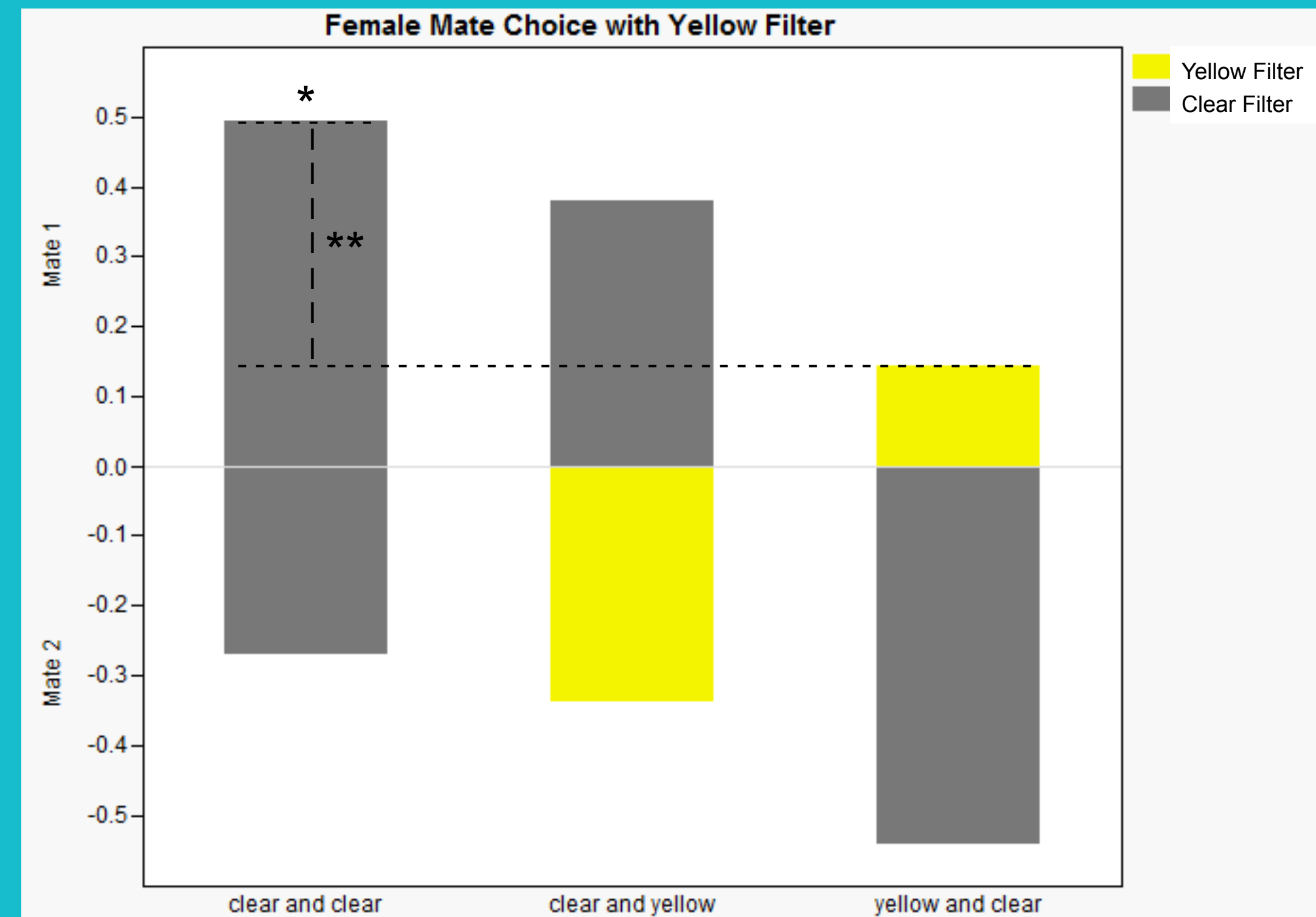
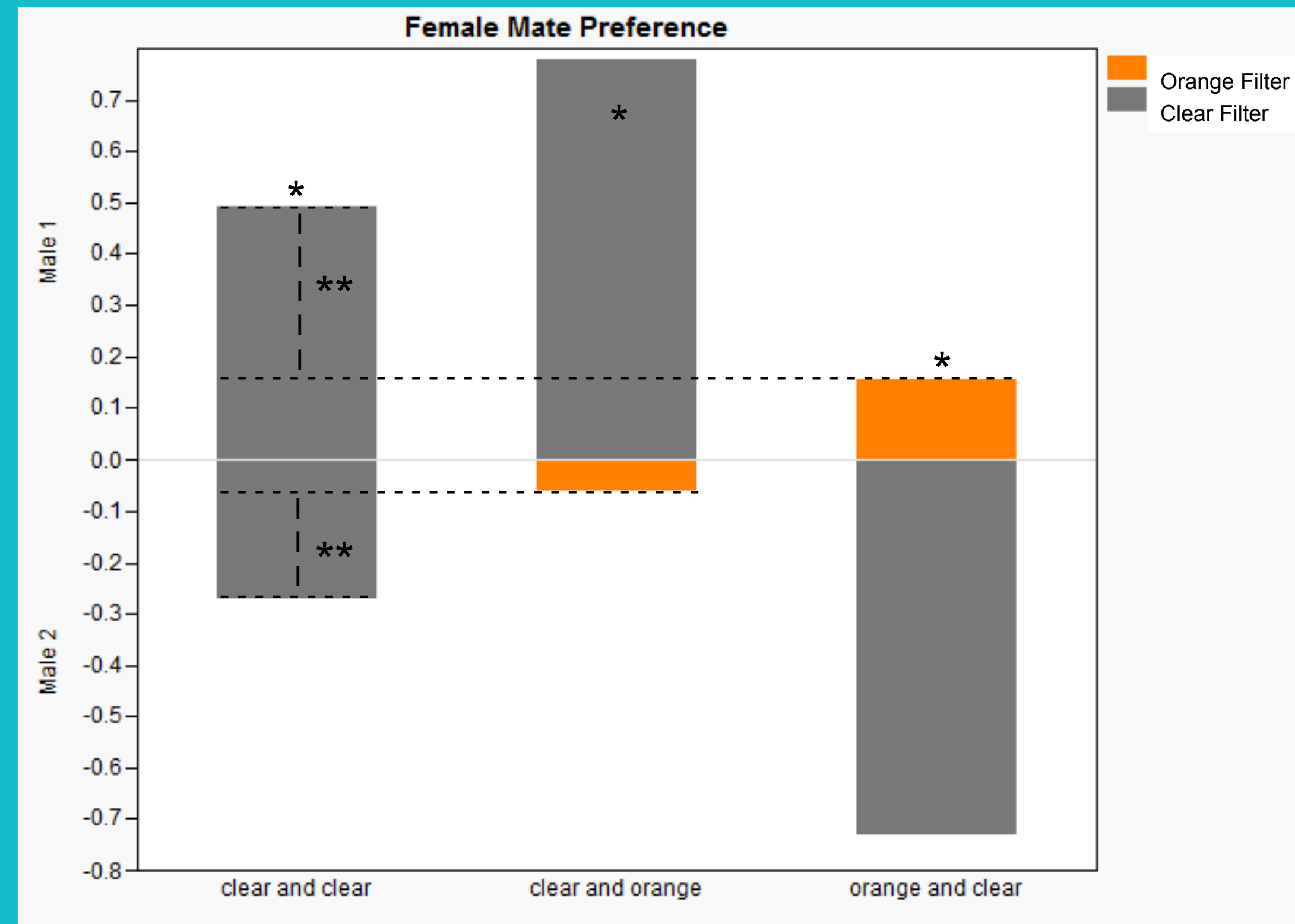
- We presented female guppies with the option to interact with either a male with orange spots or a male with no orange spots. The fish were separated by clear plastic dividers (see above image.)
- We compared the time she spent with each male to determine which she preferred.
- We changed the dividers between her and the two males to see if her preferences changed. These are the color combinations:

Orange Male (M1)	No Orange Male (M2)
clear	orange
clear	yellow
orange	clear
yellow	clear

Results:

Do Orange Filters Make Males More Attractive?

- Females prefer the male with orange spots ($p=0.0260$)
- Females prefer the naturally sexy and orange male over the male with cosmetic enhancement ($p=0.0033$)
- Females prefer the non-orange male over the orange male with an orange filter ($p=0.0364$)
- When there is an orange filter in front of Male 2, the females like him much less than when there is no filter ($p=0.0476$)
- When the orange filter is in front of Male 1, females like him less than usual ($p=0.0275$) and they like the less sexy male much more ($p=0.0282$)



Do Yellow Filters Make Males More Attractive?

- Females show no preference between males if Male 2 has a yellow filter ($p=0.5946$)
- Though not significant, females show interest in the less orange male when the other male has the yellow filter. ($p=0.1919$)
- Females don't like the Male 1 with a yellow filter as much as the Male 1 in the control test ($p=0.0265$)

Discussion:

Orange filters make the attractive guppy behind them less attractive

Possible reasons?

- Females find the combination of orange and spots attractive, due to the similarities with fruit.
- Orange filters remove the spot shape making males less attractive.
- There may be such thing as too much orange, and there is an ideal area of orange.
- Guppies that stand out more are more attractive.
- Females may simply dislike orange filters.
- Female preference is influenced on light outside of the human visual spectrum.

Yellow filters make females like orange males less.

Possible reasons?

- The yellow filter makes the orange lighter.
- Guppies that stand out more are more attractive.
- Females don't like yellow filters.
- Female preference is influenced on light outside of the human visual spectrum.

References:

- Deere, Kerry A.; Grether, Gregory F.; Sun, Aida; et al. "Female mate preference explains countergradient variation in the sexual coloration of guppies (*Poecilia reticulata*)."
Proceedings of the Royal Society B-Biological Sciences. Vol. 279 (2012):1684-1690.
- Rodd, F. H., et al. (2002). "A possible non-sexual origin of mate preference: are male guppies mimicking fruit?"
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