

# Sexy Crayfish: Dominance vs. Size

## Female Crayfish Mate Choice: Role of Male Size and Social Ranking

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Female Crayfish prefer higher ranking males (1) and larger males (2). But usually large males are the higher ranking males.

**What is a more important factor in mate choice: size or social ranking?**

### Fun Facts about Crayfish!

- Crayfish are freshwater crustaceans.
- On average, they are 175 mm (6.9 inches!!!) in length, though our experimental crayfish ranged from 60 to 90 mm.

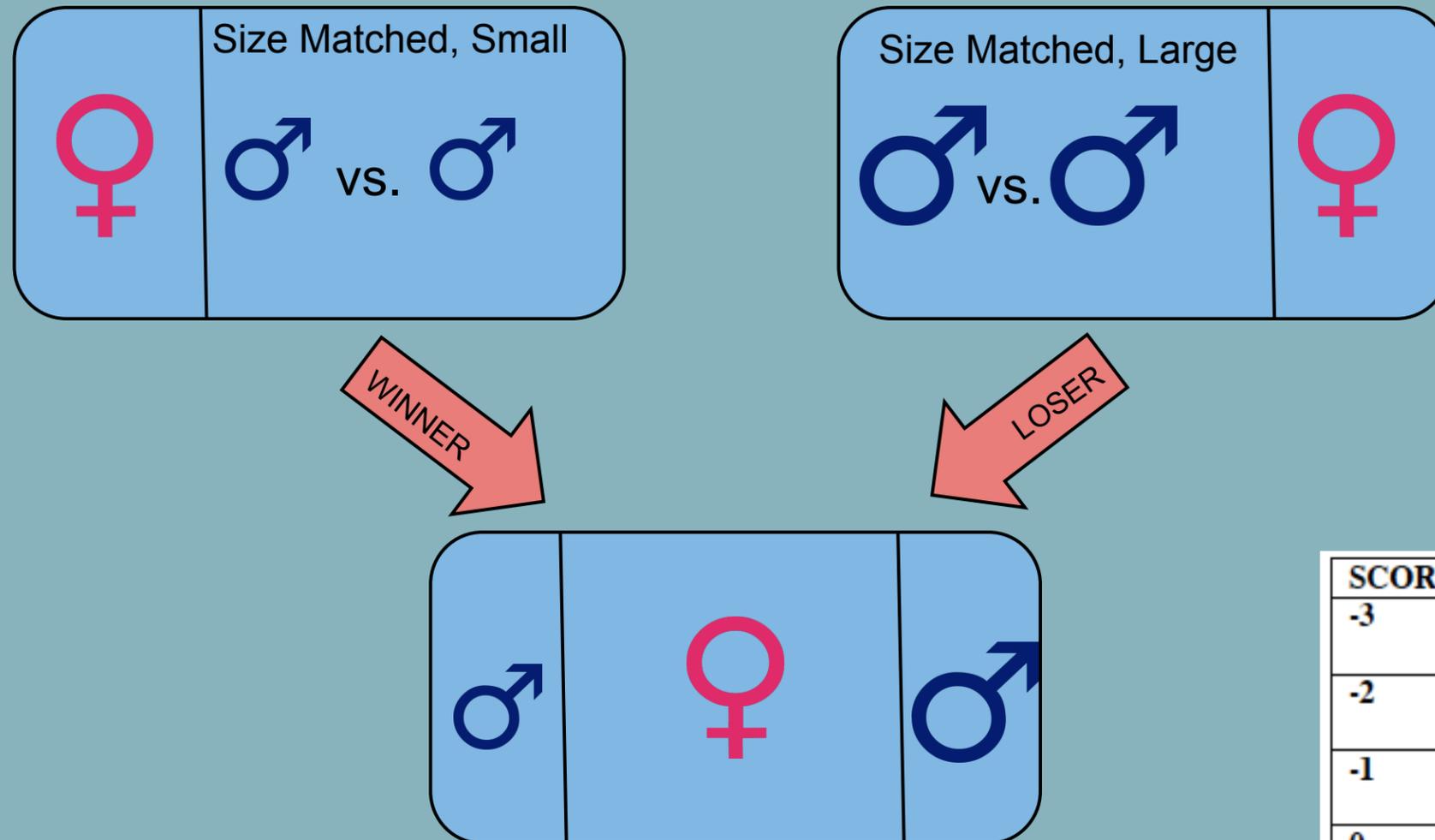


- Crayfish have short lifespans (around two years).
- They become sexually mature in October and November, and they can lay up to 800 eggs!!



**Hypothesis: Male size is favored over high social ranking in determining female mate choice.**

# Experimental Design:



SCORE	BEHAVIOR	DESCRIPTION
-3	Tailflip	Rapid ventral movement of the tail results in the crayfish shooting backwards (away from opponent).
-2	Tailtuck	Tail is tucked under the abdomen (no rapid resulting movement)
-1	Avoidance	Crayfish walks away from opponent (leaving a wide berth of > 1 body length) usually moves in reverse.
0	Separate	Crayfish is > 2 body lengths from opponent and makes no directed movement.
1	Approach	Crayfish walks toward opponent (may include contact without the claw display)
2	Threat	Crayfish approaches opponent with outspread claw and may strike opponent without locking claws.
3	Fight	Crayfish locked claw(s) over opponent with braced stance to flip opponent.

Figure 1. Ethogram used to score fights and determine winner and loser males.

- Males and females were kept separately for two weeks prior to trials
- Female crayfish observed two fights:
  - Two small crayfish
  - Two large crayfish
- Females were given the choice between the small winner and large loser
- Choice was measured by time spent with each male

# Results and Analysis:

Hypothesis: Male size is favored over high social ranking in female mate choice.

**Results: On average, male social ranking appears to be a more important factor in female mate choice, though the results were not significant.**



5 trials, 10 minutes each, were observed using Jwatcher (3) software event recorder.

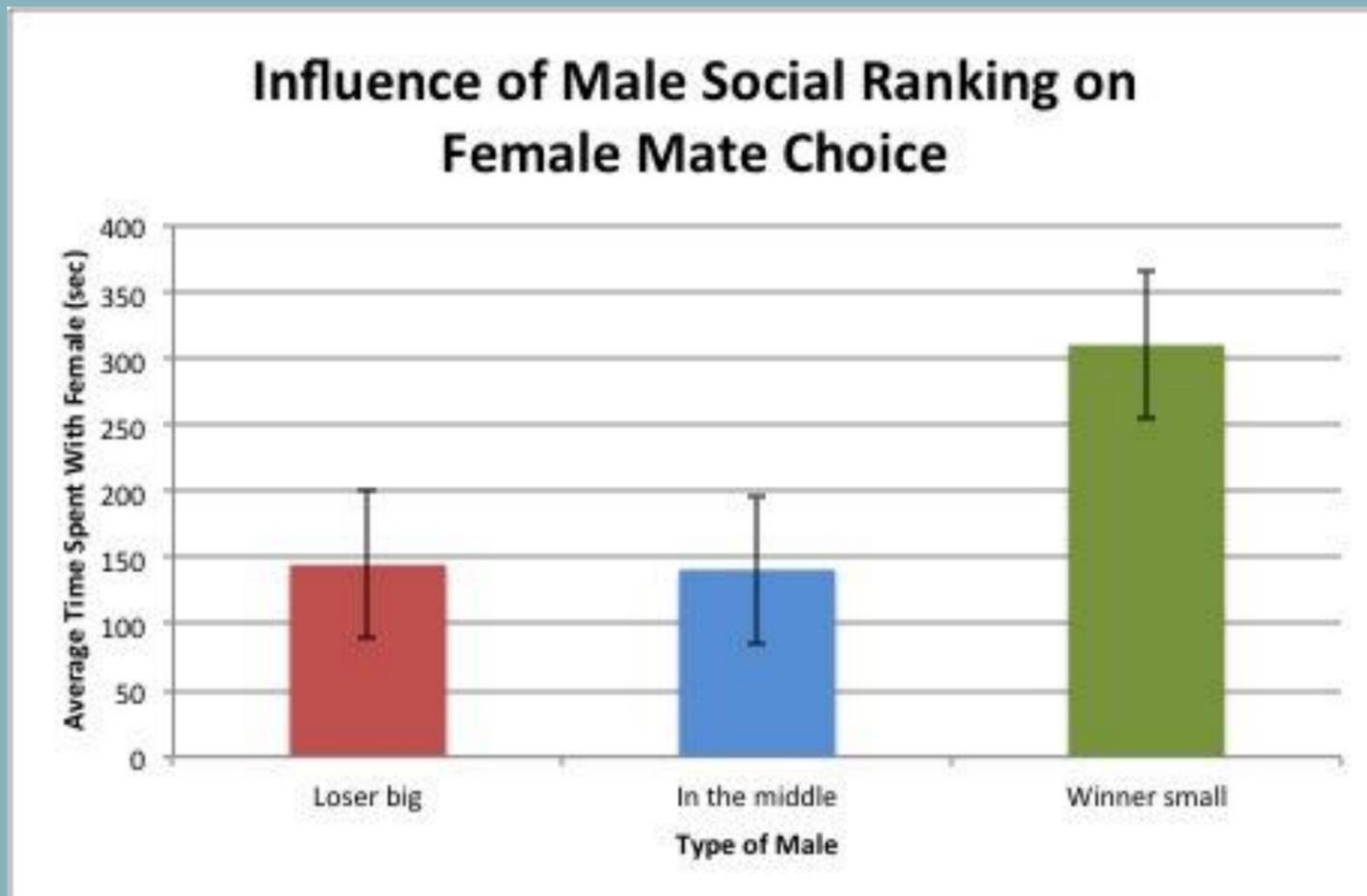


Figure 1: Comparison of average time spent by the female in the middle of the tank, near the winner small male, and near the lose big male. On average, females spent twice as much time near the winner small males than near the loser big males and in the middle of the tank.

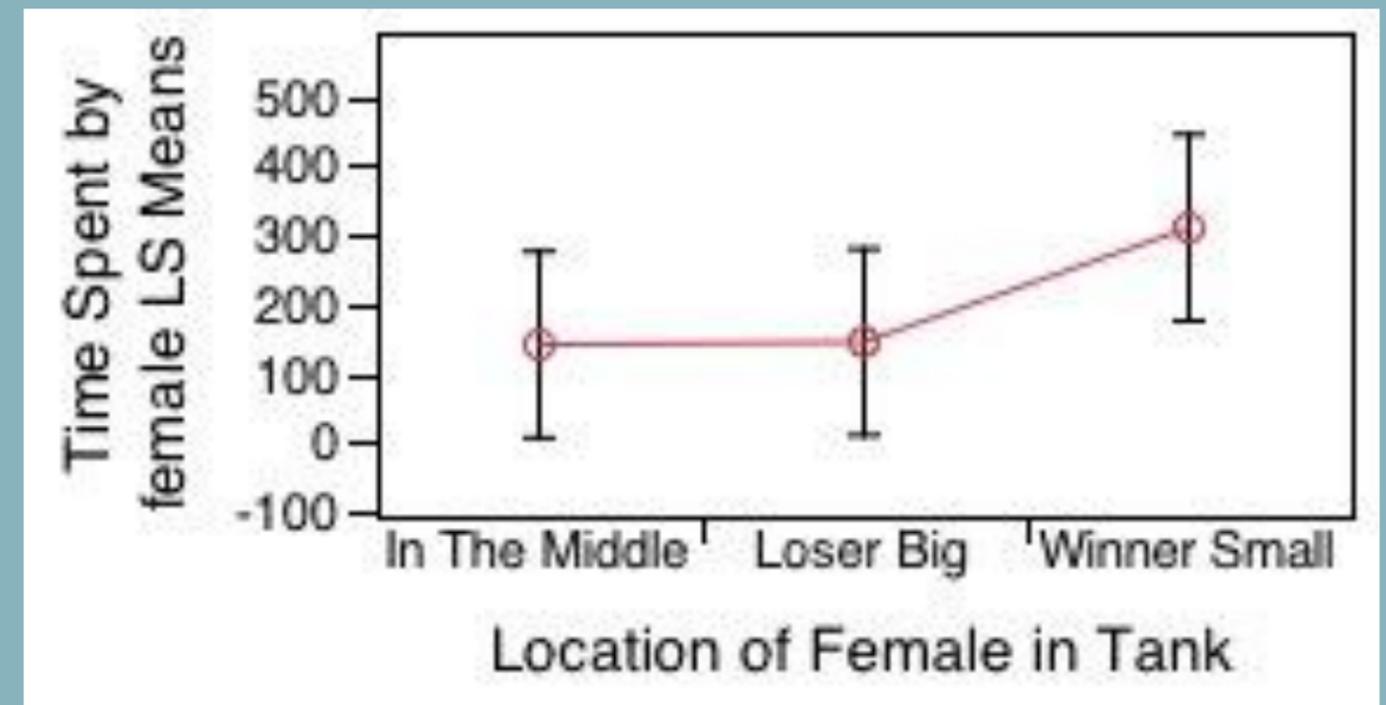


Figure 2: The LS means plot of average time spent by the female in three tank locations: in the middle, near the loser big male, and near the winner small male. None of the locations were significantly favored by the female over any of the other locations.

## Our Conclusion:

**Social ranking appears more important than size in female mate choice!**

## Future Directions:

- Need more trials to see if data is statistically significant
- Does social ranking affect male mate choice?
- Do other indicators of health (e.g. parasites) affect crayfish mate choice?
- Can this help save threatened species of crayfish??



### Referneces:

- 1 Aquiloni, L., Buric, M., Gheredi, F. (2008) Crayfish females eavesdrop on fighting males before choosing the dominant. *Current Biologu* **18**: R462-R463.
- 2 Aquiloni, L., Gherardi, F. (2008) Mutual mate choice in crayfish: large body size is selected by both sexes, virginity by males only. *J of Zoology*, **274**: 171-179.
3. Gheradi, F., Renai, B., Galeotti, P., Rubolini, D. (2006) Nonrandom mating, mate choice, and male-male competition in the crayfish *Austropotamobius italicus*, a threatened species. *Archic Fur Hydrobiologie*, **165.4**: 557-76

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