



# The Hormone AVT Affects Competitive Behavior in *Hyla chrysoscelis*

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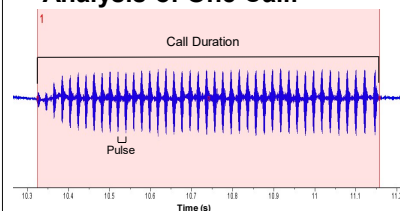
## Introduction

- Male frogs produce acoustic advertisement calls to attract females, and they compete with one another by changing their call rate and call duration.
- In *H. versicolor*, the hormone Arginine Vasotocin (AVT) causes males to produce more attractive calls [1].
- **We don't know how AVT affects the response to competition.**
- **The effects of AVT have not been tested in *H. chrysoscelis***

## Methods

- Inject frog with 25µL saline or 25µg AVT suspended in 25µL of saline.
- After 30 minutes, take 3 minute baseline recording of calling behavior ("Pre").
- Expose to moderately competitive playback and record calling response for 3 minutes.
- Repeat with highly competitive playback and record response for 3 minutes.
- After highly competitive playback, record 3 minute post competition response ("Post").

### Analysis of One Call:



Call Rate = # calls/sec  
Duty Cycle = Call Rate \* Call Duration

## Results

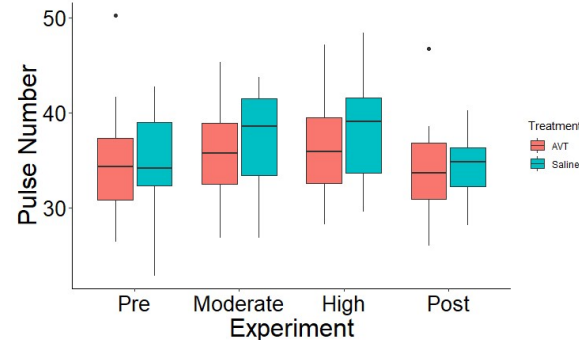


Figure 1. Effect of treatment and experiment type on pulse number. There was not a difference in pulse number ( $p=0.29$ ) between saline ( $n=14$ ) and AVT individuals ( $n=23$ ).

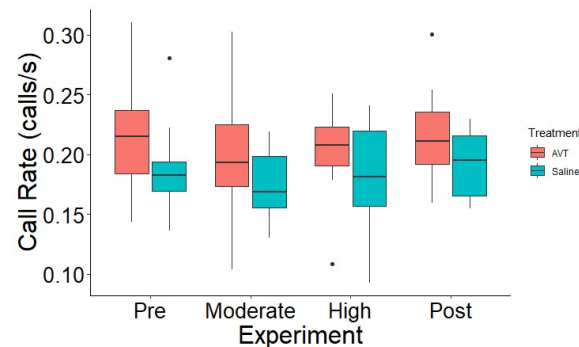


Figure 2. Effect of treatment and experiment type on call rate. AVT-treated frogs ( $n=23$ ) had a significantly higher call rate ( $p=0.02$ ) than saline-treated frogs ( $n=14$ ).

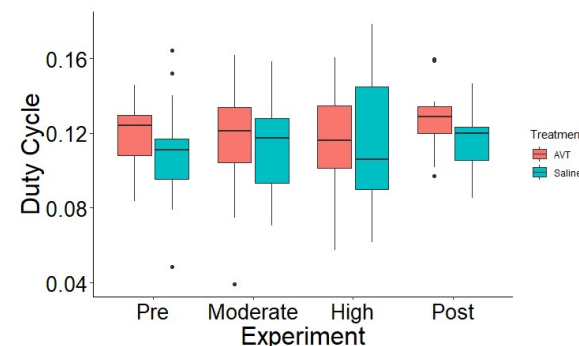


Figure 3. Effect of treatment and experiment type on duty cycle. AVT frogs had a higher duty cycle in noncompetitive environments (pre/post recordings;  $p=0.04$ ), but exhibited no difference in duty cycle in competitive environments (moderate/high;  $p=0.67$ ). Overall, there was not a difference in duty cycle between AVT ( $n=23$ ) and saline ( $n=14$ ) individuals ( $p=0.15$ ).



## Conclusion

- Saline frogs have a lower duty cycle in noncompetitive environments, which is less attractive to females.
- Treatment affected duty cycle in noncompetitive environments but not in competitive environments, suggesting that AVT frogs may perform at peak ability in both noncompetitive and competitive environments.
- Our results are similar to a finding in cricket frogs where AVT increased motivation to call [2].
- Overall *H. chrysoscelis* has comparable results to *H. versicolor* studies.

## Acknowledgements and References

### Acknowledgements:

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### References:

- [1] Kramsberg KF, Marler CA. The neuropeptide arginine vasotocin alters male call characteristics involved in social interactions in the grey treefrog, *Hyla versicolor*. *Animal Behaviour*. 2000;59(4):807-812.  
[2] Marler, C. A., Chu, J., & Wilczynski, W. Arginine vasotocin injection increases probability of calling in cricket frogs, but causes call changes characteristic of less aggressive males. *Hormones and Behavior*. 1995;29(4):554-570.