

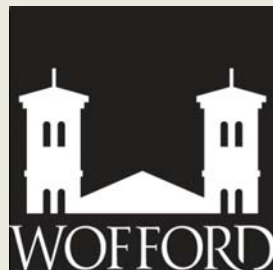
# Assessment Behavior in Neonate Copperhead Snakes is Correlated with Familiarity and Not Kinship



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**REPRESENTING SPRING 2013 VERTEBRATE  
BIOLOGY AND ANIMAL BEHAVIOR**

**DEPARTMENT OF BIOLOGY**



# Introduction

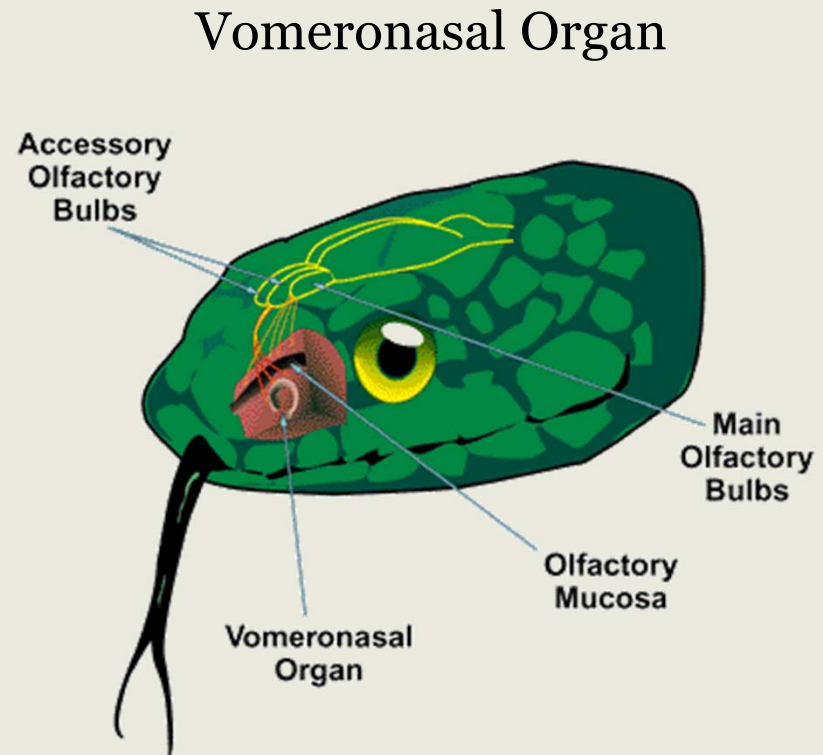


- Snakes previously viewed as asocial
- Kin selection study
- 2012: Factors influencing aggregation



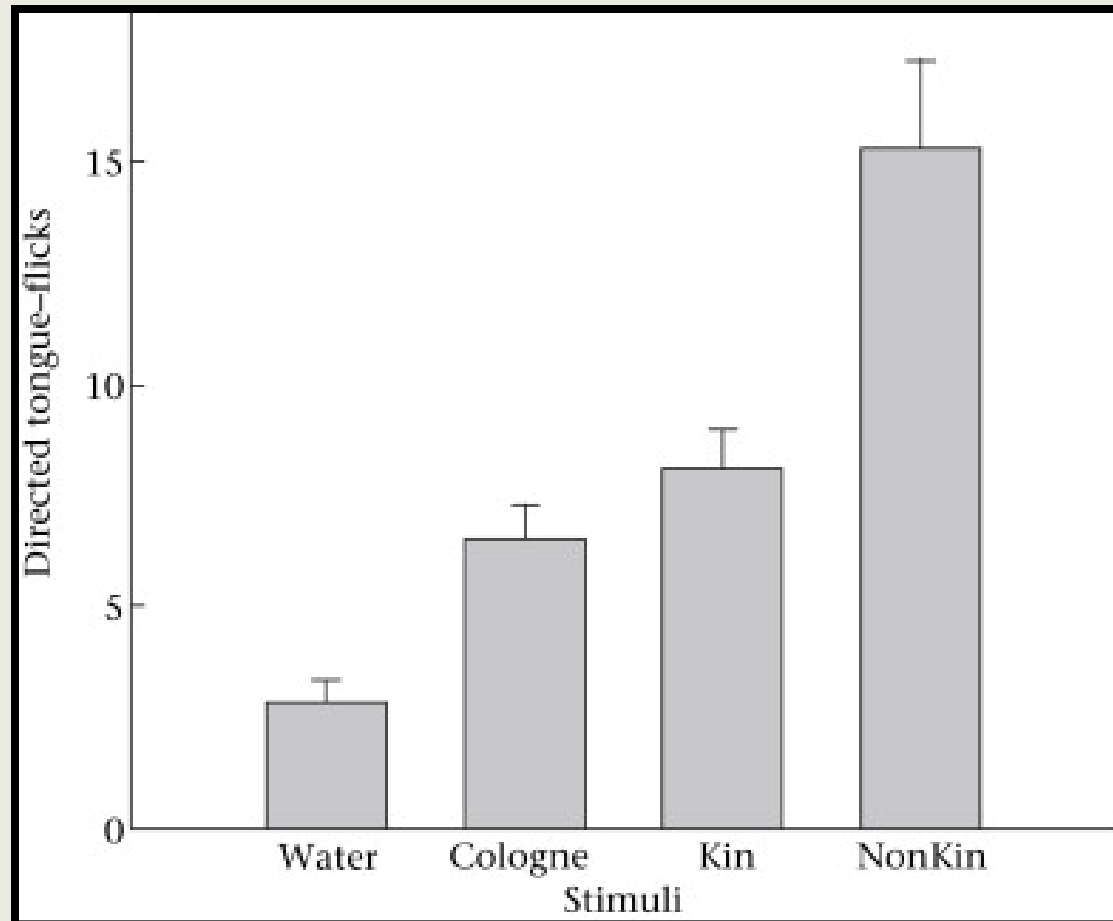
# Communication in snakes

- Primary mode of communication is chemosensory
- Significance of tongue flicks



<http://www.neuro.fsu.edu/~mmered/vomer/snake.htm>

# Chemoreception and kin recognition in snakes



Pernetta et al. 2009

# Timeline of Methods



Summer  
2011

- Dr. Smith and colleagues collected snakes
- Began cross fostering study

Spring  
2012

- Video footage recorded and observed
- Observed factors influencing aggregation

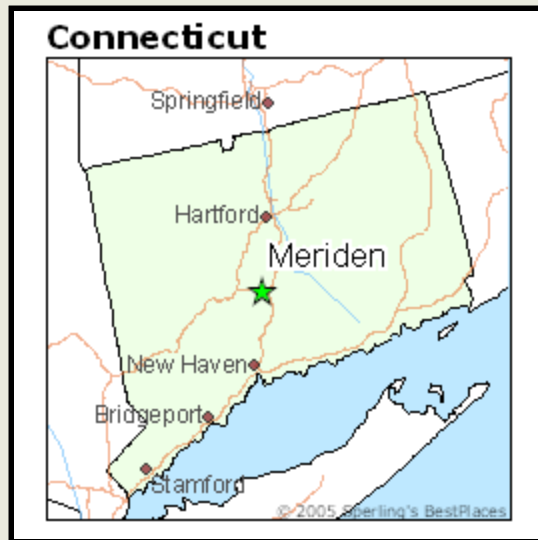
Spring  
2013

- Analyzed video footage
- Observed “assessment behavior”

# Methods



- 20 pregnant female copperheads captured
- Weighed, measured and tagged





# Treatment of neonates



- Neonates born August 24 to September 7, 2011
  - Total =144 individuals
- Cross fostering experiment
  - 1/2 remained with birth mother
  - 1/2 placed with foster mother
- After 3 weeks, isolated and housed individually until testing



# Preparation and pairings



- Female neonates in balanced random pairings
- Pairing groups
  - Siblings raised together
  - Siblings raised apart
  - Non-siblings raised together
  - Non-siblings raised apart
- Kinship kept blind from experimenters





# Experiment



- 27 pairings
- Each pairing: 4 days continuous recording
- Collected over 2,500 hours of video footage



# Assessment Behavior



Example of head – head encounter

[Video](#)

# Methods



- Students analyzed 1-2 days of video
- Quantified data in ethogram
- Analyzed data using JMP<sup>®</sup> statistical software



# Ethogram Information



- Number of encounters
- Time the snakes start recognition
- Time start encounter
- Who initiated encounter
- Time end encounter
- Outcome (approach, strike, recoil...)
- Tongue flicking
- Tail Rattle





# Ethogram Information



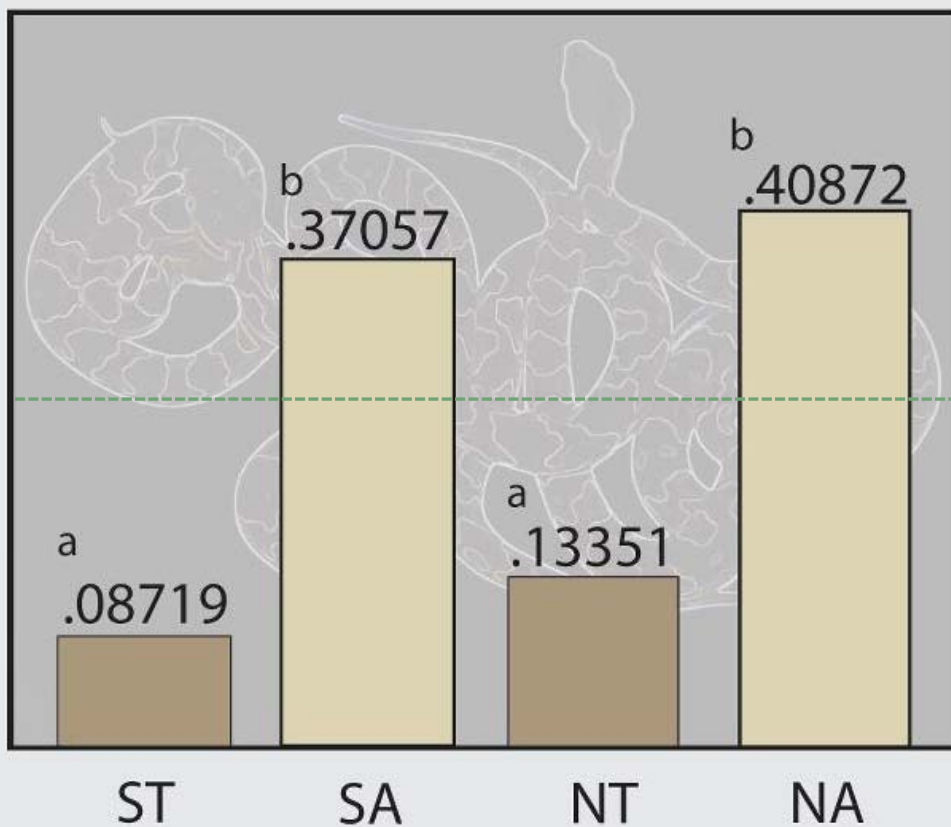
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# Results: Chi Square Analysis



Proportion of total behaviors observed



ST= siblings raised together  
SA= siblings raised apart  
NT= non- siblings raised together  
NA= non- siblings raised apart

Letters depict significant differences at  $\alpha = 0.05$

# Discussion of Our Results



- Assessment behavior duration
- Frequency of behavior
- Recognition correlations
- Consistent with proposed mechanisms





# Future Directions



- Test genetic relationship
- Isolate various sensory signals
- Interactions with other species/environments



# Acknowledgements



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