Assessment Behavior in Neonate Copperhead Snakes is Correlated with Familiarity and Not Kinship
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
<table>
<thead>
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<th>Timeline of Methods</th>
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| **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
  - ½ remained with birth mother
  - ½ 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® 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

- **Number of encounters**
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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
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