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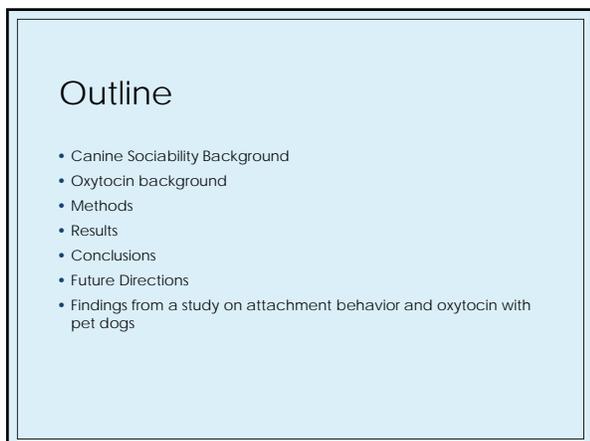
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## What is Sociability?

- An individual's interest & attitude toward a conspecific (member of the same species) or to people (Svartberg, 2007)
- Degree of friendliness or amicability in a dog's personality (Kaminski & Marshall-Pescini, 2014)



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## Why might we be interested in studying canine sociability?

- As a behavioral trait
- For standardized behavior tests
- As a predictor of success in homes
- Does higher sociability = higher adoption success/shorter length of stay?
- Can short in-kennel interactions boost sociability in shelter dogs?

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## Objective

- Determine whether different in-kennel interactions or oxytocin administration affects sociability in shelter dogs



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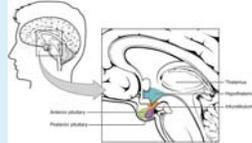
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## Oxytocin (OT)

- Hormone
- Involved in formation and maintenance of social bonds
- Promotes affiliative behavior
- Synthesized by the hypothalamus



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## OT and Human-Dog Attachments

- When dogs gaze at owners, urinary OT concentrations increase in both dogs and owners (Nagasawa et al., 2015; Nagasawa et al., 2009)
- Higher OT levels in dogs and owners were correlated with more positive relationships based on questionnaires (Handlin et al., 2012)



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## OT Administration in Dogs

- Intranasally administered OT increases affiliative behaviors towards familiar humans and familiar conspecifics (Romero et al., 2014)
- OT increased duration of gazing at owner for female dogs but not males (Nagasawa et al., 2015)
  - This increased urinary OT concentrations in owners of female dogs



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## Subjects

- 30 adoptable dogs from Willamette Humane Society and Heartland Humane society
  - No pregnant or nursing females
- Pseudorandomly assigned to 1 of 3 in-kennel conditions
  - Groups balanced according to age

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## In-kennel conditions

- Social play and social interaction: an unfamiliar person provided vocal praise, petting and social play
- Oxytocin (OT), a naturally occurring hormone involved in social bond formation and maintenance in both dogs and humans, was administered nasally.
- Control: an unfamiliar person stood in the dog's kennel without providing any interaction



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## Sociability Test

- Took place 45 min. after in-kennel condition (to allow for OT to take effect)
- Testing room: adoption room at each shelter
- Setup:
  - Unfamiliar person sat in chair
  - Semicircle 1 m in radius taped on floor around chair
  - 2 phases, each 2 minutes long



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## Sociability Test

- Inattentive phase: Unfamiliar person could pet the dog twice without talking, making eye contact, or restraining the dog by the collar
- Attentive phase: Unfamiliar person could freely interact with the dog while remaining seated



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## Behavioral Coding

- Duration of time inside circle
- Duration of time in contact with the person



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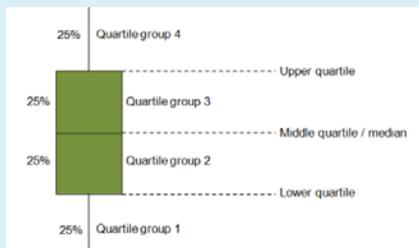
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## Interpreting the data: Box and Whisker Plots



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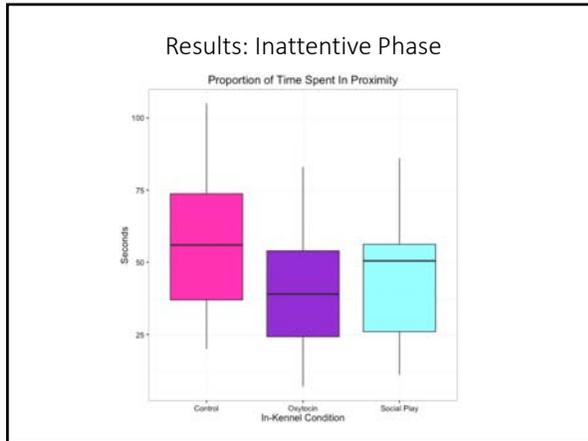
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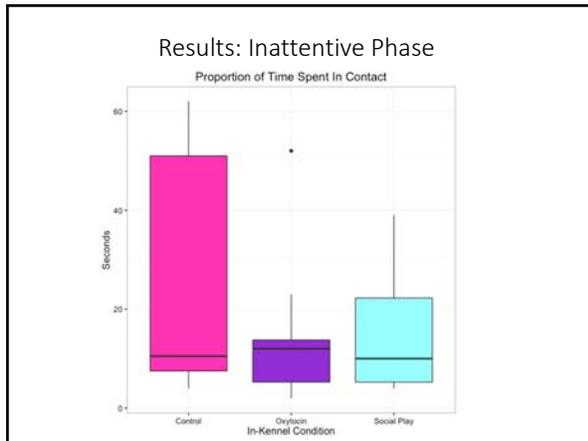
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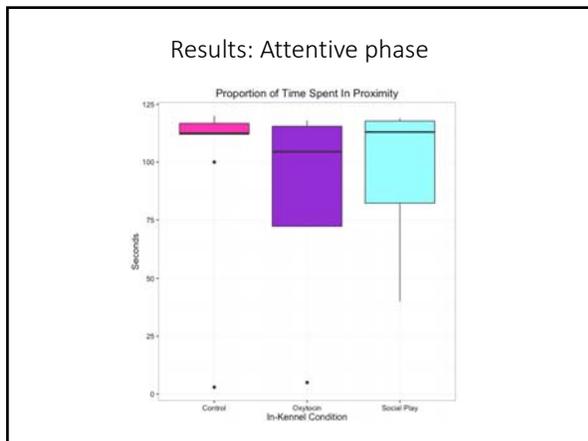
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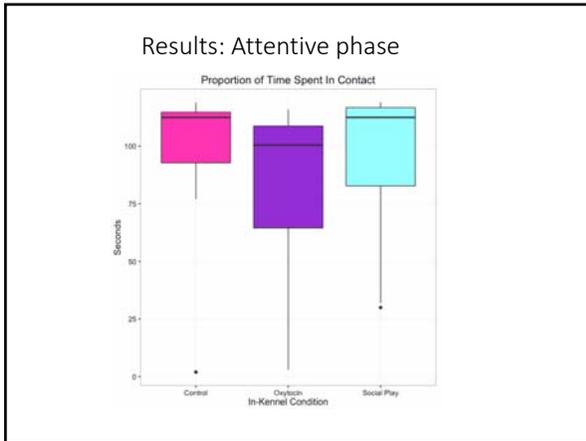
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## Conclusions

- No measurable impacts on sociability were found



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## Future Directions

- Varying length of time in-kennel interactions occur
- Comparing different kinds of interactions
  - Vocal praise
  - Play
  - Petting
  - Training
- Measures of welfare
- Pre- and post-adoption

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## Attachment

- "A reciprocal relationship between the primary attachment figure and the individual" (Parthasarathy & Crowell-Davis, 2006)
- Individuals have an innate predisposition to form attachments with others
  - Increases security by decreasing risk of harm (predation, anxiety)



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## Strange Situation Test (SST)

- With mothers, infants and an unfamiliar person (Ainsworth & Bell, 1970)
- Involved a series of reunion and separation episodes involving a parent and a stranger
- Attachment styles classified as:
  - Secure
  - Insecure-Avoidant
  - Insecure-Ambivalent
- Has also been conducted with dogs



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## Study design

- 40 pet dogs
- Two testing sessions per dog
  - Spaced at least 5 days apart
- Dogs were randomly assigned to either receive OT first (n=20) or saline (n=20) first
- Experimenter, owners and video coders were blind to treatment
- Attachment test



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## Phases of Attachment Test

Phase	Description
<b>Phase 1 (Baseline)</b> 2 minutes	Owners were instructed to sit in chair in testing room and pet the dog twice each time it entered the circle.
<b>Phase 2 (Alone)</b> 2 minutes	Owner and experimenter exited the room and the dog was left alone.
<b>Phase 3 (Return)</b> 2 minutes	Owner and experimenter quietly re-entered the room without greeting the dog. Owners were instructed to sit in chair in testing room and pet the dog twice each time it entered the circle. (Identical to baseline.)

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## Objective and Hypothesis

- Objective: To determine effects of OT on dog attachment behavior
- Hypotheses:
  - 1.) If OT increases feelings of security in attachment relationships, dogs that receive OT will display fewer stress-related behaviors when left alone than dogs receiving saline
  - 2.) If OT increases affiliative behavior in dogs, time spent in contact with, and in proximity to, their owners will increase when dogs receive OT vs. saline.




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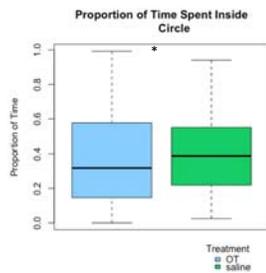
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## Results: Baseline



- Dogs that received saline spent more time inside the circle compared to dogs that received OT,  $p = 0.04091$
- No other significant differences found in any phases of attachment test

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## Conclusions

- Overall, OT appears to have limited effects on attachment behavior and sociability
- In baseline, dogs spent less time seeking proximity when OT was administered
  - Effect appears to be driven by males
- Other studies have found relatively small effect sizes in many cases
  - OT's effectiveness in applied settings may be limited
- Stress during administration may have affected behavior

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## Future Directions

- Compare results to dogs with separation anxiety
- Explore alternatives to administering exogenous OT
  - When owners gaze at and pet their dogs, dogs' OT levels increase
  - Less stressful approach may be useful for fearful/anxious populations



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- Society of Animal Welfare Administrators & National Council on Pet Population
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## Questions?



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