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### Intranasally administered oxytocin decreases heart rate and increases heart rate variability in dogs

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In recent years an increasing number of studies have used intranasal oxytocin administration in order to explore its effects on human social cognition. This approach is based on the tacit assumption that intranasal administration of oxytocin enables direct access of the peptide to the central nervous system. In humans, the effects of intranasal oxytocin on both behavioral and physiological levels are well-documented. The increasing interest in dog social cognition makes it timely to study the effect of intranasal oxytocin in this species. To validate the intranasal administration of oxytocin in dogs we examined whether it had parallel effects on behavior and physiological parameters such as heart rate and heart rate variability to those of a study for any effects on dog social cognition. The individual variation in the effect of oxytocin on HR and HRV make it a good indicator of the physiological effect of oxytocin and so could be used as a covariate in future behavioral studies. Ten adult pet dogs of different breeds participated in two test occasions receiving 12 IU oxytocin and placebo nasal spray (in a counterbalanced order) followed by a 40-minutes waiting period and an ECG recording. A considerable individual variation could be observed in the effect of oxytocin on heart rate (HR) and heart rate variability (HRV). However, at the group level oxytocin significantly decreased HR and increased HRV. These results are in line with the findings from human studies and thus indicate that intranasal administration of oxytocin might be a valid approach to study its effects on dog social cognition. The individual variation in the effect of oxytocin on HR and HRV make it a good indicator of the physiological effect of oxytocin, suggesting it could be used as a covariate in future behavioral studies.

**Key words:** intranasal oxytocin; dog; heart rate; heart rate variability

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### Citizen science in canine science

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“Citizen science”—public involvement in formal scientific research—can benefit both participants and researchers. In citizen science projects, the public accesses a scientific thinking platform and “real-world” scientific experiences, and researchers gain additional support for data collection and exploration. As citizen scientists continue to contribute to a wide range of fields, researchers increasingly focus on technical issues—like project design, participant skill and data quality—to ensure citizen scientists make meaningful contributions to public participation projects. Since the late 1990s, the field of canine science has relied heavily on dog owners and their dogs for passive or active study involvement. This researcher-guided approach is increasingly typical of the field’s data acquisition process. This method also represents a less conventional approach to citizen science as it often does not incorporate many of the participant engagement or feedback strategies characteristic of traditional citizen science. In recent years, a few studies have incorporated infrastructures more

typical of citizen science projects. For example, participants collect and provide data for researchers to analyze, or researchers provide content for volunteers to evaluate or code (Hecht and Spicer Rice, *in press*). Established public participation models could provide a validated framework for researchers to incorporate citizen science. This, in turn, could expand the scope and scale of canine science projects, as well as increase the accuracy and validity of the data acquired. Additionally, canine researchers can join others in conversations on best practices through organizations like the Citizen Science Association.

**Key words:** dog; citizen science association; data quality; public participation

### Reference

Hecht, J., Spicer Rice, E. *In press*. Citizen science: A new direction in canine behavior research. *Behav. Process.*

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### Categories and consequences of dog-human play: A citizen science approach

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Dogs play extensively throughout their lives with both humans and conspecifics. While play contains specific identifiable elements, like play signals, it can differ in form and content between individuals and dyads. Play is often cited as an indicator of positive welfare, but the relationship between play’s content and affective state warrants further consideration. This study used a large-scale, citizen-science approach to collect examples of dog-human play in naturalistic contexts. Videos were coded and analyzed to categorize and characterize play, its behavioral forms (types of play), content (physical contact, proximity, vocalizations, movement, and play signals), and affect (positive or neutral). The study was advertised internationally using social-media platforms and requested videos of “you and your dog playing”. Between December 2012 and March 2013, over 200 varied submissions were contributed to a designated website. Preliminary video analysis suggests a relationship between type of play and person visible affect, as well as a relationship between touch, proximity, and affect. Play with high levels of contact and movement was correlated with owners’ positive affect. Additionally, people with positive affect spent more time in close proximity to the dog than people with neutral affect. Finally, there was no notable difference in the proportion of time in face-to-face contact with the dog between people of different affects. This study represents a successful use of citizen science and contributes to the growing inquiry into interspecific dyadic play, with attention to play as an indicator of good welfare.

**Key words:** dog; dog-human interaction; interspecific play; play

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### Social referencing in cat-owner dyads

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