

# Daniel J. Horschler

Curriculum Vitae

## Contact Information

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Yale University  
Department of Psychology  
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## Academic Employment

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**Yale University** (2021 – Present)  
Department of Psychology  
Comparative Cognition Lab & Computational Social Cognition Lab  
NSF SBE Postdoctoral Fellow



## Education

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**The University of Arizona**  
*Ph.D.*, Anthropology (2021)  
*M.A.*, Anthropology (2018)  
Foci: Biological Anthropology & Cognitive Science



**The University of North Carolina at Chapel Hill**  
*B.S.*, Psychology (2016)  
Foci: Cognitive Psychology & Anthropology  
Highest Distinction & Highest Honors



## Research Experience

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**Computational Social Cognition Lab**, New Haven, CT (2021 – Present)  
**Comparative Cognition Lab**, New Haven, CT (2021 – Present)  
**Canine Cognition Center at Yale**, New Haven, CT (2015; 2021 – Present)  
**Cayo Santiago Biological Field Station**, Punta Santiago, Puerto Rico (2016 – Present)  
**Canine Companions for Independence**, Santa Rosa, CA & Oceanside, CA (2016 – Present)  
**Derby City Agility Association**, Louisville, KY (2021 – Present)  
**Humane Society of Southern Arizona**, Tucson, AZ (2018 – 2021)  
**Arizona Canine Cognition Center**, Tucson, AZ (2016 – 2021)  
**Wildlife Science Center**, Stacy, MN (2018)  
**Human Memory Lab**, Chapel Hill, NC (2015 – 2016)  
**Lenovo User Experience Research Team**, Morrisville, NC (2014 – 2016)  
**Somatosensory Research Lab**, Chapel Hill, NC (2013 – 2014)

## Peer-Reviewed Publications

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13. **Horschler, D.J.**, Bray, E.E., Gnanadesikan, G.E., Byrne, M., Levy, K.M., Kennedy, B.S., & MacLean, E.L. (2022). Dogs re-engage human partners when joint social play is interrupted: A behavioural signature of shared intentionality? *Animal Behaviour*, 183, 159-168.
12. ManyDogs Project, Espinosa, J., Bray, E.E., Buchsbaum, D., Byosiére, S.E., Byrne, M., Freeman, M.S., Gnanadesikan, G.E., Alexandrina Guran, C.-N., **Horschler, D.J.**, Huber, L., Johnston, A.M., MacLean, E.L., Pelgrim, M.H., Santos, L., Silver, Z.A., Stevens, J.R., Völter, C.J., & Zipperling, L. (Accepted registered report). ManyDogs 1: A multi-lab replication study of dogs' pointing comprehension. *Animal Behavior and Cognition*.
11. Bray, E.E., Gnanadesikan, G.E., **Horschler, D.J.**, Levy, K.M., Kennedy, B.S., Famula, T.R., & MacLean, E.L. (2021). Early-emerging and highly heritable sensitivity to human communication in dogs. *Current Biology*, 31(14), 3137-3144.  
† *Featured on the issue's cover*
10. Salomons, H., Smith, K.C.M., Callahan-Beckel, M., Callahan, M., Levy, K., Kennedy, B.S., Bray, E.E., Gnanadesikan, G.E., **Horschler, D.J.**, Gruen, M., Tan, J., White, P., vonHoldt, B.M., MacLean, E.L., & Hare, B. (2021). Cooperative communication with humans evolved to emerge early in domestic dogs. *Current Biology*, 31(14), 3132-3136.
9. **Horschler, D.J.**, Santos, L.R., & MacLean, E.L. (2021). How do non-human primates represent others' awareness of where objects are hidden? *Cognition*, 212, 104658.
8. Arre, A.M.\* & **Horschler, D.J.\*** (2021). Swimming and diving as social play in juvenile rhesus macaques (*Macaca mulatta*). *Behaviour*, 158(6), 529-546. [\*Denotes equal contribution]
7. Bray, E.E., Gruen, M.E., Gnanadesikan, G.E., **Horschler, D.J.**, Levy, K.M., Kennedy, B.S., Hare, B.A., & MacLean, E.L. (2020). Dog cognitive development: A longitudinal study across the first two years of life. *Animal Cognition*, 24(2), 311-328.
6. **Horschler, D.J.**, MacLean, E.L., & Santos, L.R. (2020). Advancing gaze-based research on primate theory of mind. *Trends in Cognitive Sciences*, 24(10), 778-779.
5. Bray, E.E., Gruen, M.E., Gnanadesikan, G.E., **Horschler, D.J.**, Levy, K.M., Kennedy, B.S., Hare, B.A., & MacLean, E.L. (2020). Cognitive characteristics of 8-to-10-week-old assistance dog puppies. *Animal Behaviour*, 66, 193-206.
4. **Horschler, D.J.**, MacLean, E.L., & Santos, L.R. (2020). Do non-human primates really represent others' beliefs? *Trends in Cognitive Sciences*, 24(8), 594-605.
3. **Horschler, D.J.** & MacLean, E.L. (2019). Leveraging brain-body scaling relationships for comparative studies. *Animal Cognition*, 22(6), 1197-1202.

**2. Horschler, D.J., Santos, L.R., & MacLean, E.L. (2019).** Do non-human primates really represent others' ignorance? A test of the awareness relations hypothesis. *Cognition*, 190, 72-80.

**1. Horschler, D.J., Hare, B., Call, J., Kaminski, J., Miklósi, Á., & MacLean, E.L. (2019).** Absolute brain size predicts dog breed differences in executive function. *Animal Cognition*, 22(2), 187-198.

† Selected as the issue's highlight article

## Manuscripts

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Mulligan, N.W., Susser, J.A., & **Horschler, D.J.** (In revision). Action memory and metamemory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*.

Salomons, H., Smith, K.C.M., Callahan-Beckel, M., Callahan, M., Levy, K., Kennedy, B.S., Bray, E.E., Gnanadesikan, G.E., **Horschler, D.J.**, Gruen, M., Tan, J., White, P., vonHoldt, B.M., MacLean, E.L., & Hare, B. (In prep). Reply to Wheat et al. commentary on 'Cooperative communication with humans evolved to emerge early in domestic dogs.'

**Horschler, D.J.**, Berke, M., Santos, L.R., & Jara-Ettinger, J. (In prep). A first look at computationally modeling non-human primate theory of mind.

## Conference Presentations

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**24.** Bray, E.E., Gnanadesikan, G.E., **Horschler, D.J.**, Levy, K.M., Kennedy, B.S., Famula, T.R., & MacLean, E.M. (2021). Development and heritability of cognitive traits in Canine Companions dogs. Talk presented at the International Working Dog Conference (Virtual meeting).

**23. Horschler, D.J.**, MacLean, E.L., & Santos, L.R. (2021). What do non-human primates represent about others' knowledge of hidden objects? Talk presented at the Annual Conference of the European Society for Philosophy and Psychology (Virtual meeting).

**22. Horschler, D.J.**, Bray, E.E., & MacLean, E.L. (2021). Interpreting dogs' re-engagement behaviors after disrupted joint activities. Talk presented at the Yale University East Coast Canine Cognition Workshop (Virtual meeting).

**21. Horschler, D.J.**, Bray, E.E., & MacLean, E.L. (2021). Do dogs form joint intentions with humans in social play? Talk presented at the Society for Personality and Social Psychology's Origins of the Social Mind Preconference (Virtual meeting).

**20.** Bray, E.E., Gnanadesikan, G.E., **Horschler, D.J.**, & MacLean, E.L. (2021). Heritable variation in dog social cognition. Thread presented at the Animal Behavior Society and Association for the Study of Animal Behaviour Twitter Conference (Virtual meeting).

19. Gnanadesikan, G.E., Espinosa, J.H., & **ManyDogs**. (2021). ManyDogs 1: An international collaborative approach to pointing comprehension in domestic dogs. Thread presented at the Animal Behavior Society and Association for the Study of Animal Behaviour Twitter Conference (Virtual meeting).
18. **Horschler, D.J.**, Bray, E.E., & MacLean, E.L. (2020). Do dogs re-engage humans when joint experiences end? Talk presented at the Yale University East Coast Canine Cognition Workshop, New Haven, CT.
17. Bray, E.E., Gnanadesikan, G.E., **Horschler, D.J.**, & MacLean, E.L. (2020). Early development and longitudinal stability of cognitive traits in working dogs. Talk presented at the Yale University East Coast Canine Cognition Workshop, New Haven, CT.
16. MacLean, E.L., Bray, E.E., Gnanadesikan, G.E., & **Horschler, D.J.** (2020). Associations between individual differences in cognition and training outcomes in assistance dogs. Talk presented at the Yale University East Coast Canine Cognition Workshop, New Haven, CT.
15. **Horschler, D.J.**, Santos, L.R., & MacLean, E.L. (2019). Awareness relations underpin knowledge representation in rhesus monkeys. Talk presented at the UA-ASU Cognitive Science Conclave, Tucson, AZ.
14. **Horschler, D.J.**, Santos, L.R., & MacLean, E.L. (2019). How do non-human primates represent what others know? Talk presented at the 7<sup>th</sup> Annual Conference of the Southwestern Association of Biological Anthropologists, Tempe, AZ.
- † *Awarded prize for best student podium presentation*
13. MacLean, E.L., Bray, E.E., Gnanadesikan, G.E., & **Horschler, D.J.** (2019). Ontogeny and heritability of cognitive and temperamental traits in an assistance dog population. Talk presented at the International Canine Science Conference, Tempe, AZ.
12. **Horschler, D.J.**, Santos, L.R., & MacLean, E.L. (2019). Do non-human primates really represent others' ignorance? Talk presented at the 26<sup>th</sup> International Conference on Comparative Cognition, Melbourne Beach, FL.
- † *Selected as a finalist for the Ron Weisman Outstanding Student Presentation Award*
11. Bray, E.E., Gnanadesikan, G.E., **Horschler, D.J.**, & MacLean, E.L. (2019). Early emerging cognition in 9-week-old puppies. Talk presented at the 26<sup>th</sup> International Conference on Comparative Cognition, Melbourne Beach, FL.
10. MacLean, E.L., Bray, E.E., Gnanadesikan, G.E., & **Horschler, D.J.** (2019). Heritability of cognitive traits in a pedigreed dog population. Talk presented at the 26<sup>th</sup> International Conference on Comparative Cognition, Melbourne Beach, FL.
9. Gnanadesikan, G.E., **Horschler, D.J.**, & MacLean, E.L. (2019). Social cues and hormonal profiles over development in wolf puppies. Poster presented at the GPSC Student Showcase, Tucson, AZ.
8. **Horschler, D.J.** & MacLean, E.L. (2018). Absolute brain size predicts dog breed differences in executive function and social cognition. Poster presented at the GPSC Student Showcase, Tucson, AZ.

7. **Horschler, D.J.** & MacLean, E.L. (2018). Dogs as a model for the cognitive implications of neuroanatomical variation. Talk presented at the Yale University East Coast Canine Cognition Workshop, New Haven, CT.
6. MacLean, E.L. & **Horschler, D.J.** (2018). Breed differences in dog cognition are predicted by absolute brain volume. Talk presented at the 126<sup>th</sup> Annual Convention of the American Psychological Association, San Francisco, CA.
5. **Horschler, D.J.** & MacLean, E.L. (2017). Absolute brain size predicts dog breed differences in executive function and social cognition. Poster presented at the UA-ASU Cognitive Science Conclave, Tucson, AZ.
4. **Horschler, D.J.** & MacLean, E.L. (2017). Absolute brain size predicts dog breed differences in working memory and social cognition. Poster presented at the North American Canine Science Forum, Tempe, AZ.
3. **Horschler, D.J.**, Susser, J.A., & Mulligan, N.W. (2016). Metamemory for performed and observed actions: Within-subjects. Poster presented at the UNC Psychology and Neuroscience Honors Poster Symposium, Chapel Hill, NC.
2. **Horschler, D.J.**, Susser, J.A., & Mulligan, N.W. (2016). Metamemory for performed and observed actions: Within-subjects. Poster presented at the UNC Celebration of Undergraduate Research, Chapel Hill, NC.
1. **Horschler, D.J.** (2014). Insights into user experience at Lenovo. Poster presented at the Karen M. Gil Internship Program Poster Symposium, Chapel Hill, NC.

## Invited Talks

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**University of Arizona**, HNRS 395H: Spiritual and Scientific Approaches to Consciousness (2021)  
**Yale University**, PHIL 271: Philosophy of Language (2020)  
**Boston College**, Canine Cognition Center and Social Learning Laboratory (2020)  
**University of Arizona**, AGUA Student Lecture Series (2019)  
**University of Arizona**, Grad Slam Competition (2019)  
**Yale University**, Comparative Cognition Laboratory (2019)  
**University of North Carolina at Chapel Hill**, PSYC 67: The Senses of Animals (2015)

## Grants and Fellowships

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### Current Support

NSF SBE Postdoctoral Research Fellowship (2022 – 2024) ..... \$138,000  
 Title: *Understanding the Evolutionary Origins of Theory of Mind: Computational Modeling of Conserved Cognitive Mechanisms Across Primates*  
 Role: Principal Investigator  
 Co-PIs: Dr. Laurie Santos and Dr. Julian Jara-Ettinger

### Fellowships

UofA Haury Dissertation Fellowship (2020 – 2021)

UofA Graduate College Fellowship (2016 – 2018)  
UofA Graduate Access Fellowship (2016 – 2017)  
UofA School of Anthropology Emil W. Haury Fellowship (2016 – 2017)

### **Grants**

SPSP Origins of the Social Mind Registration Award (2021)  
UofA School of Anthropology Traditions, Transitions, & Treasures Research Grant – Fall (2020)  
UofA Raphael and Jolene Gruener Research Travel Award (2020)  
UofA School of Anthropology Traditions, Transitions, & Treasures Research Grant – Spring (2020)  
UofA School of Anthropology Traditions, Transitions, & Treasures Research Grant (2019)  
UofA School of Anthropology Riecker Research Grant (2019)  
UofA Graduate & Professional Student Council Travel Grant (2019)  
UofA Graduate Interdisciplinary Programs Herbert E. Carter Travel Award (2019)  
UofA School of Anthropology Traditions, Transitions, & Treasures Travel Grant (2018)  
UofA Graduate & Professional Student Council Travel Grant (2018)  
UNC-CH Psychology and Neuroscience Gillian T. Cell Senior Thesis Award (2015)

### **Teaching Experience**

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**NSCS 200: Fundamentals of Neuroscience and Cognitive Science** (Spring 2020)  
University of Arizona • Department of Neuroscience • School of Mind, Brain & Behavior  
Graduate Teaching Associate • ~160 students

**ANTH 170C2: Animal Minds** (Fall 2019)  
University of Arizona • School of Anthropology • College of Social and Behavioral Sciences  
Graduate Teaching Associate • Two sections (~30 students each)

**ANTH 327: Dog Thought** (Spring 2019)  
University of Arizona • School of Anthropology • College of Social and Behavioral Sciences  
Graduate Teaching Associate • ~150 students

**NSCS 321: Research Methods in Cognitive Science** (Fall 2018)  
University of Arizona • Department of Neuroscience • School of Mind, Brain & Behavior  
Graduate Teaching Assistant • ~110 students

**ANTH 170: Human Variation in the Modern World** (Fall 2017 & Spring 2018)  
University of Arizona • School of Anthropology • College of Social and Behavioral Sciences  
Graduate Teaching Assistant • Two sections per semester (~30 students each)

### **Selected Media Coverage**

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**Absolute brain size predicts dog breed differences in executive function, *Animal Cognition* (2019)**  
[ScienceDaily](#) | [Sky News](#) | [Insider](#) | [Psychology Today](#) | [talkRADIO London](#) |  
[The Naked Scientists Podcast](#) | [Arizona Public Media \(NPR/PBS\)](#) | [ABC 15 \(Phoenix, AZ\)](#) |

[KOLD News 13 \(Tucson, AZ\)](#) | [KVOI Radio \(Tucson, AZ\)](#)

**Swimming and diving as social play in juvenile rhesus macaques (*Macaca mulatta*), *Behaviour* (2021)**

[Psychology Today](#): What can we learn from a monkey water park?

**Early-emerging and highly heritable sensitivity to human communication in dogs, *Current Biology* (2021)**

[Science](#) | [Smithsonian Magazine](#) | [Scientific American](#) | [Yahoo! News](#) | [NBC News](#) | [CNN](#) | [CBC](#) | [BBC](#) | [Axios](#) | [Gizmodo](#) | [NewScientist](#) | [KVOA News 4 \(Tucson, AZ\)](#)

**Cooperative communication with humans evolved to emerge early in domestic dogs, *Current Biology* (2021)**

[Scientific American](#) | [CNN](#) | [The Telegraph](#) | [The Times](#) | [EurekAlert!](#) | [Haaretz](#) | [ScienceNews](#) | [Live Science](#) | [Phys.org](#) | [Duke Today](#) | [Miami Herald](#) | [The News & Observer \(Raleigh, NC\)](#) | [StarTribune \(Minneapolis, MN\)](#)

### **Commentary on Related Research**

[National Geographic](#): Centuries of breeding have reshaped dog brains—here's how

[The Washington Post](#): As humans shaped dogs' bodies, we also altered their brains

[Science](#): Humans haven't just changed what dogs look like—we've altered the very structure of their brains

## **Relevant Coursework**

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Animal Behavior • Biopsychology • Child Development • Cognitive Neuroscience of Imagination • Cognitive Psychology • Cognitive Science Colloquium • Evolutionary Psychology • Fundamentals of Evolutionary Biology • History of Anthropological Theory • Human Cognitive Evolution • Human Evolutionary Biology • Introduction to Programming • Philosophy of Mind • Primate Behavior • R Programming: Applied Statistical Analysis • R Programming: Data Analysis/Visualization • R Programming: Intro/Multivariate Statistics • Statistical Principles of Psychological Research

## **Undergraduate Mentoring**

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### **Thesis Supervision**

Madeline Meade (Ecology & Evolutionary Biology, Yale; 2022 expected)

Amelia Bryony (Anthropology, UofA; 2020): *Dog brain size and executive function*

Tegan Wambold (Anthropology, UofA; 2018): *Shared intentionality between humans and canines*

### **Directed Research Supervision**

Saskia Braden (Yale; 2021), Julia Gourary (Yale; 2021), Eunsoo Hyun (Yale; 2021),

Monika Krasniqi (Yale; 2021), Jamie Marrara (Yale; 2021), Felix Mebius (Yale; 2021),

Lily Siegel (Yale; 2021), Elizabeth Carranza (UofA; 2020 – 2021), Alex Evans (UofA; 2020 – 2021),

Thomas Kile (UofA; 2017 – 2019), Julia Kemper (UofA; 2017), Lindsey Lang (UofA; 2017)

## Science Outreach

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### **Letters to a Pre-Scientist** (2020 – Present)

Participating in a STEM pen pal program with middle school students from underserved communities

### **Application Statement Feedback Program** (2021)

Volunteering as an editor to assist graduate school applicants from underrepresented backgrounds

### **Research Demonstration for AP/Honors High School Students**, Tucson, AZ (2018 & 2019)

Dog cognition experiment demo organized by the Office of Admissions, University of Arizona

### **Dogtoberfest Dog Festival**, Tucson, AZ (2017 & 2018)

Dog cognition experiment demo at a fundraiser for Handi-Dogs, Inc.

### **Dog Days with the Dean**, Tucson, AZ (2017)

Dog cognition experiment demo organized by the Dean of Students Office, University of Arizona

### **Storm Phobia in Shelter Dogs**, Tucson, AZ (2016)

Advised the First LEGO League Robotics team at Sunrise Drive Elementary School

### **Undergraduate Poster Symposium**, Chapel Hill, NC (2015)

Poster judge for PSYC 67: The Senses of Animals

### **BarkFest Dog Festival**, New York City, NY (2015)

Represented and recruited participants for the Canine Cognition Center at Yale

## Professional Service

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### **Ad-Hoc Reviewer**

*American Journal of Primatology • Animal Cognition • Biology Letters • Cognition • Current Zoology • Frontiers in Veterinary Science • Journal of Comparative Psychology • Learning and Motivation • PeerJ • Scientific Reports • The Federation of European Biochemical Societies Journal • Topics in Cognitive Science*

### **Research and Projects Grant Reviewer**

Graduate & Professional Student Council, University of Arizona

### **Travel Grant Reviewer**

Graduate & Professional Student Council, University of Arizona

### **Membership**

American Association for the Advancement of Science • Animal Behavior Society • Cognitive Science Society • Comparative Cognition Society • National Postdoctoral Association