

Emily E. Bray

Emily Elizabeth Bray, MA, PhD, CAAB

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PROFESSIONAL EXPERIENCE

- Assistant Professor**, University of Arizona, Tucson, AZ **May 2023 – Present**
College of Veterinary Medicine (primary appointment)
Psychology (affiliate appointment)
- Research Scientist**, Canine Companions for Independence[®], Santa Rosa, CA **May 2023 – May 2024**
- Certified Applied Animal Behaviorist**, credentialed by the Animal Behavior Society **2023-Present**
- Post-doctoral Research Associate** (Supervisors: Dr. Evan MacLean and Dr. Brenda Kennedy)
Focus: Longitudinal cognitive and behavioral studies in assistance dogs
University of Arizona, School of Anthropology, Tucson, AZ **May 2017 – Oct 2022**
University of Arizona, College of Veterinary Medicine, Tucson, AZ, **Oct 2022 – April 2023**
and Canine Companions for Independence[®], Santa Rosa, CA **May 2017 – April 2023**

EDUCATION

- University of Pennsylvania, Philadelphia, PA **May 2017**
PhD in Psychology (concentration: Animal Learning & Behavior); Teaching Certificate in College & University Teaching
Dissertation: “A longitudinal study of maternal style, young adult temperament and cognition, and program outcome
in a population of guide dogs”
Advisors: Dr. Robert Seyfarth, Dr. Dorothy Cheney, and Dr. James Serpell (committee chair: Angela Duckworth)
- University of Pennsylvania, Philadelphia, PA **May 2013**
M.A. in Psychology
Thesis: “Dogs as a model system for understanding problem-solving: Exploring the affective and cognitive mechanisms that
impact inhibitory control”
Advisors: Dr. Robert Seyfarth, Dr. Dorothy Cheney, and Dr. James Serpell
- Duke University, Durham, NC **May 2012**
B.A. in Cognitive Psychology and English (*summa cum laude*), Graduation with Distinction in Psychology
Psychology GPA 4.0, Cumulative GPA 3.97
Thesis (distinction): “Factors Affecting Inhibitory Control in Dogs” (advisors: Dr. Brian Hare & Dr. Stephen Mitroff)
- University College London, London, UK **August 2010 - December 2010**
Semester Abroad through Butler University’s Institute for Study Abroad

PEER-REVIEWED PUBLICATIONS

22. Hargrave, S.H., **Bray, E.E.**, McGrath, S., Alexander, G.E., Block, T.A., Chao, N., Darvas, M., Douglas, L.E.L.C., Galante, J., Kennedy, B.S., Kusick, B., Moreno, J.A., Promislow, D.E.L., Raichlen, D.A., Switzer, L.R., Tees, L., Underwood Aguilar, M., Urfer, S.R., Dog Aging Project Consortium, & MacLean, E.L. (accepted). Characterizing Dog Cognitive Aging Using Spontaneous Problem-Solving Measures: Development of a Battery of Tests from The Dog Aging Project. *GeroScience*.
21. Gnanadesikan, G.E., Tandon, D., **Bray, E.E.**, Tennenbaum, S., MacLean, E.L., & vonHoldt, B.M. (2024). Transposons in the Williams-Beuren Syndrome critical region are associated with social behavior in assistance dogs. *Behavior Genetics*, 54, 196-211. doi: 10.1007/s10519-023-10166-7.
20. ManyDogs Project, Espinosa, J., Stevens, J.R., Alberghina, D., Alway, H.E., Barela, J.D., Bogese, M., **Bray, E.E.**, Buchsbaum, D., Byosiere, S.E., Byrne, M., Cavalli, C.M., Chaudoir, L.M., Collins-Pisano, C., DeBoer, H.J.,

- Douglas, L.E.L.C., Dror, S., Dzik, M.V., Ferguson, B., Fisher, L., Fitzpatrick, H.C., Freeman, M.S., Frinton, S.N., Glover, M.K., Gnanadesikan, G.E., Goacher, J.E.P., Golańska, M., Guran, A., Hare, E., Hare, B., Hickey, M., Horschler, D.J., Huber, L., Jim, H., Johnston, A.M., Kaminski, J., Kelly, D.M., Kuhlmeier, V.A., Lassiter, L., Lazarowski, L., Leighton-Birch, J., MacLean, E.L., Maliszewska, K., Marra, V., Montgomery, L.I., Murray, M.S., Nelson, E.K., Ostojić, L., Palermo, S.G., Parks Russell, A.E., Pelgrim, M.H., Pellowe, S.D., Reinholz, A., Rial, L.A., Richards, E.M., Ross, M.A., Rothkoff, L.G., Salomons, H., Sanger, J.K., Santos, L., Schirle, A.R., Shearer, S.J., Silver, Z.A., Silverman, J.M., Sommese, A., Srdoc, T., St. John-Mosse, H., Vega, A.C., Vékony, K., Völter, C.J., Walsh, C.J., Worth, Y.A., Zipperling, L.M.I., Żołędziewska, B., & Zylberfuden, S.G. (2023). ManyDogs 1: A multi-lab replication study of dogs' pointing comprehension. *Animal Behavior and Cognition*, *10*(3), 232-286. doi: 10.26451/abc.10.03.03.2023.
19. ManyDogs Project, Alberghina, D., **Bray, E.E.**, Buchsbaum, D., Byosiere, S.E., Espinosa, J., Gnanadesikan, G.E., Guran, A., Hare, E., Horschler, D.J., Huber, L., Kuhlmeier, V.A., MacLean, E.L., Pelgrim, M.H., Perez, B., Ravid-Schurr, D., Rothkoff, L., Sexton, C.L., Silver, Z.A., & Stevens, J.R. (2023). ManyDogs Project: A Big Team Science Approach to Investigating Canine Behavior and Cognition. *Comparative Cognition & Behavior Reviews*, *18*, 59-77. doi:10.3819/CCBR.2023.180004.
18. Salomons, H., Smith, K., Callahan-Beckel, M., Callahan, M., Levy, K., Kennedy, B., **Bray, E.E.**, Gnanadesikan, G., Horschler, D., Gruen, M., Jingzhi, T., White, vonHoldt, B., MacLean, E. & Hare, B. (2023). Response to Hansen Wheat et al.: Additional analysis further supports the early emergence of cooperative communication in dogs compared to wolves raised with more human exposure. *Learning & Behavior*, *51*(2), 131-134. doi: 10.3758/s13420-023-00576-2.
17. **Bray, E.E.**, Raichlen, D.A., Forsyth, K., Promislow, D.E.L., Alexander, G.E., MacLean, E.L., & Dog Aging Project Consortium (2023). Associations between physical activity and cognitive dysfunction in older companion dogs: Results from the Dog Aging Project. *GeroScience*, *45*, 645-661. doi: 10.1007/s11357-022-00655-8.
16. **Bray, E.E.**, Zheng, Z., Tolbert, M.K., McCoy, B., Dog Aging Project Consortium, Kaerberlein, M., & Kerr, K.F. (2022). Once-daily feeding is associated with better health in companion dogs: Results from the Dog Aging Project. *GeroScience*, *44*, 1779-1790. doi: 10.1007/s11357-022-00575-7.
15. 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 behavioral signature of shared intentionality? *Animal Behaviour*, *183*, 159-168. doi: 10.1016/j.anbehav.2021.11.007.
14. **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), 3132-3136. doi: 10.1016/j.cub.2021.04.055.
13. Hall, N.J., Johnston, A.M., **Bray, E.E.**, Otto, C.M., MacLean, E.L., & Udell, M.A.R. (2021). Working dog training for the twenty-first century. *Frontiers in Veterinary Science*, *8*:646022. doi: 10.3389/fvets.2021.646022.
12. Salomons, H., Smith, K., Callahan-Beckel, M., Callahan, M., Levy, K., Kennedy, B., **Bray, E.E.**, Gnanadesikan, G., Horschler, D., Gruen, M., Tan, J., White, P., MacLean, E., & Hare, B. (2021). Cooperative communication with humans evolved to emerge early in domestic dogs. *Current Biology*, *31*(14), 3137-3144. doi: 10.1016/j.cub.2021.06.051.
11. **Bray, E.E.**, Otto, C.M., Udell, M.A.R., Hall, N.J., Johnston, A.M., & MacLean, E.L. (2021). Enhancing the selection and performance of working dogs. *Frontiers in Veterinary Science*. *8*:644431. doi: 10.3389/fvets.2021.644431.
10. **Bray, E.E.**, Gruen, M.E., Gnanadesikan, G.E., Horschler, D.J., Levy, K. M., Kennedy, B.S., Hare, B.A., & MacLean, E.L. (2021). Dog cognitive development: a longitudinal study across the first 2 years of life. *Animal Cognition*, *24*, 311-328. doi: 10.1007/s10071-020-01443-7.

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9. **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*, 166, 193-206. doi:10.1016/j.anbehav.2020.05.019.
8. Byrne, M., **Bray, E.E.**, MacLean, E.L., & Johnston, A.M. (2020). Evidence for win-stay-lose-shift in puppies and adult dogs. *Proceedings of the Cognitive Science Society*.
7. **Bray, E.E.**, Levy, K.M., Kennedy, B.S., Duffy, D.L., Serpell, J.A., & MacLean, E.L. (2019). Predictive models of assistance dog training outcomes using the Canine Behavioral Assessment and Research Questionnaire and a standardized temperament evaluation. *Frontiers in Veterinary Science*. 6:49. doi: 10.3389/fvets.2019.00049.
6. **Bray, E.E.**, Sammel, M.D., Cheney, D.L., Serpell, J.A., and Seyfarth, R.M. (2017). Effects of maternal investment, temperament, and cognition on guide dog success. *Proceedings of the National Academy of Sciences of the United States of America*, 114(34), 9128-9133. doi: 10.1073/pnas.1704303114.
5. **Bray, E.E.**, Sammel, M.D., Seyfarth, R.M., Serpell, J.A., and Cheney, D.L. (2017). Temperament and problem solving in a population of adolescent guide dogs. *Animal Cognition*, 20(5), 923-939. doi: 10.1007/s10071-017-1112-8.
4. **Bray, E.E.**, Sammel, M.D., Cheney, D.L., Serpell, J.A., and Seyfarth, R.M. (2017). Characterizing early maternal style in a population of guide dogs. *Frontiers in Psychology*, 8, 175. doi: 10.3389/fpsyg.2017.00175.
3. **Bray, E.E.**, MacLean, E.L., & Hare, B.A. (2015). Increasing arousal enhances inhibitory control in calm but not excitable dogs. *Animal Cognition*, 18(6), 1317-1329. doi: 10.1007/s10071-015-0901-1.
2. MacLean, E.L., Hare, B., Nunn, C.L., Addessi, E., Amici, F., Anderson, R.C., Aureli, F., Baker, J.M., Bania, A.E., Barnard, A.M., Boogert, N.J., Brannon, E.M., **Bray, E.E.**, Bray J., Brent, L.J.N., Burkart, J.M., Call J., Cantlon, J.F., Cheke, L. G., Clayton, N. S., Delgado, M.M., DiVincenti, L.J., Fujita, K., Herrmann, E., Hiramatsu, C., Jacobs, L.F., Jordan, K.E., Laude, J. R., Leimgruber, K.L., Messer, E.J.E. , Moura, A.C.deA., Ostojić, L., Picard, A., Platt, M.L., Plotnik, J.M., Range, F., Reader, S.M., Reddy, R.B., Sandel, A.A., Santos, L.R., Schumann, K., Seed, A.M., Sewall, K.B., Shaw, R.C., Slocombe, K.E., Su, Y., Takimoto, A., Tan, J., Tao, R., van Schaik, C.P., Virányi, Z., Visalberghi, E., Wade, J.C., Watanabe, A., Widness, J., Young, J.K., Zentall, T.R., & Zhao, Y. (2014). The Evolution of Self-Control. *Proceedings of the National Academy of Sciences of the United States of America*, 111(20), E2140-E2148. doi: 10.1073/pnas.1323533111.
1. **Bray, E.E.**, MacLean, E.L., & Hare, B.A. (2014). Context specificity of inhibitory control in dogs. *Animal Cognition*, 17(1), 15-31. doi: 10.1007/s10071-013-0633-z.

MANUSCRIPTS – SUBMITTED & IN PREPARATION

- Gnanadesikan, G.E., **Bray, E.E.**, Cook, E.N., Levy, K.M., Douglas, L.E.L.C., Kennedy, B.S., Tecot, S.R., & MacLean, E.L. (in revision). Basal Plasma Oxytocin & Fecal Cortisol Concentrations are Highly Heritable and Associated with Individual Differences in Behavior & Cognition in Dog Puppies. Preprint: <http://dx.doi.org/10.2139/ssrn.4828294>
- Gnanadesikan, G.E., **Bray, E.E.**, Levy, K.M., Douglas, L.E.L.C., Horschler, D.J., Hargrave, S.H., Kennedy, B.S. & MacLean, E.L. (in revision). Characterizing the Heritability of Cognitive and Behavioral Traits across Development in Domestic Dogs.
- Bray, E.E.**, Douglas, L.E.L.C., Levy, K.M., Gnanadesikan, G.E., Horschler, D.J., Kennedy, B.S., & MacLean, E.L. (in prep). Effects of maternal style and early rearing environment on puppy behavior and cognition.

OTHER PUBLICATIONS

- Gnanadesikan, G.E., **Bray, E.E.**, Levy, K.M., Horschler, D.J., Gruen, M.E., Kennedy, B.S., Hare, B. & MacLean, E.L. (2023). Dog Cognitive Development Battery Methods. *OSF*. doi: 10.17605/OSF.IO/CSK3A. <https://osf.io/ck3a/>

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RESEARCH GRANTS: CURRENT SUPPORT

Office of Naval Research— Postdoctoral Scholar/Key Personnel: Bray Developmental and Genetic Influences on Working Dog Cognition (\$303,293)	2020-2024
Eunice Kennedy Shriver National Institute of Child Health and Human Development — Co-I: Bray Multi-Site, Longitudinal Trial Evaluating the Efficacy, Mechanisms, and Moderators of Service Dogs for Military Veterans with PTSD (\$3,217,164)	2022-2026
Department of Defense— Co-I: Bray Psychiatric Service Dogs and Prolonged Exposure Therapy for Military-Connected PTSD: A Randomized Clinical Trial (\$8,435,410)	2024-2029
University of Arizona Foundation, Board of Trustees Small Grant Committee— Co-PI: Bray Pilot Funding for a UArizona College of Veterinary Medicine Veterinary Summer Scholars Research Program (\$25,000)	2024

RESEARCH GRANTS: PREVIOUS SUPPORT

National Institute on Aging— Postdoctoral Scholar/Key Personnel: Bray Development of Cognitive and Physical Activity Biomarkers for a Companion Dog Model of Alzheimer's Disease (\$300,577)	2020-2022
AKC Canine Health Foundation— PIs: Bray & MacLean (\$105,949) The Effects of Early Life Experience on Working Dog Temperament and Cognition	2018-2021
Office of Naval Research— Postdoctoral Scholar/Key Personnel: Bray (\$451,920) Ontogeny and Heritability of Cognitive and Behavioral Traits Linked to Military Working Dog Success	2017-2019
National Science Foundation Graduate Research Fellowship (\$32,000 per year)	2013 - 2016
Benjamin Franklin Fellowship, University of Pennsylvania	2012 - 2013, 2016 - 2017

HONORS AND AWARDS

2023 GeroScience Outstanding Original Research Paper Award, Fourth Prize	2024
University of Arizona: 2022 Outstanding Postdoctoral Scholar Award	2022
Wallis Annenberg PetSpace Leadership Institute Fellow, Class of 2020	2020
McDonogh School Young Alumni Award Recipient	2019
University of Arizona Sursum Fellow: Postdoctoral Research Development Grant (\$1,083)	2018-2019
School of Arts & Sciences Dean's Travel Subvention (\$500)	Spring 2017
Norman Anderson Graduate Student Fund, Dept. of Psychology (\$2,490)	Winter 2017
School of Arts & Sciences Dean's Travel Subvention (\$500)	Summer 2016
Norman Anderson Graduate Student Fund, Dept. of Psychology (\$3,000)	Summer 2015
School of Arts & Sciences Dean's Travel Subvention (\$300)	Summer 2014
Norman Anderson Graduate Student Fund, Dept. of Psychology (\$2,750)	Summer 2014
Teece Fellowship, University of Pennsylvania (\$2,000)	Summer 2013
Phi Beta Kappa, Duke University	Spring 2013
Karl E. Zener Award for Outstanding Performance in Psychology, Duke University	Spring 2012
Faculty Scholar Award Nominee, Duke University	Fall 2011
Undergraduate Research Support Office Independent Study Grant (\$400)	Fall 2011
Vertical Integration Program in Psychology Stipend (\$3,000)	Summer 2011
Student Marshal	Spring 2011
Winfred Quinton Holton Prize for Innovative Work in the Field of Education	Spring 2011
Duke Dean's List with Distinction	Fall 2008, Fall 2009, Spring 2011, Fall 2011
Duke Dean's List	Spring 2009, Spring 2010
Psi Chi Honor Society Inductee	Spring 2010

INVITED TALKS

Futures Council Inaugural Meeting, University of Arizona College of Veterinary Medicine	2024
Comparative Medicine Symposium, Arizona State University	2023
Assistance Dogs International Members Forum presentation: Research studies	2023
Faculty Research Blitz, Fall 2023 Colloquium Series, University of Arizona Department of Psychology	2023
Animal Behavior Graduate Group Winter 2023 Seminar Series, UC Davis	2023
Good Dog Good Breeder Community	2022

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Lagotto Romagnolo Club of America	2022
Evolution of Social Complexity Colloquium, Arizona State University	2021
Petminded	2021
Breeder Caretaker Seminar, Canine Companions for Independence	2021
Lunch & Learn, Penn Vet Working Dog Center	2021
Biology Department Colloquium speaker series, Sonoma State University	2020
Virtual Heritage Society stakeholder events, Canine Companions for Independence Northwest, Southwest, Northeast, Southeast, and South Central Regions	2020
Wallis Annenberg PetSpace Leadership Institute Retreat, Wallis Annenberg PetSpace	2020
1 st Annual Darwin Dogs Day, Duke Canine Cognition Center, Duke University	2019
Evolutionary Anthropology Talk Series, Duke University	2019
Breeder Caretaker Seminar, Canine Companions for Independence	2018
TEAM Volunteer Leadership Conference, Canine Companions for Independence	2018
Research update to National Board members, Canine Companions for Independence	2018
Canine Science Symposium, San Francisco SPCA	2018
National Board meeting reception, Canine Companions for Independence	2017
Centre for Research in Animal Behaviour, University of Exeter	2016
The Seeing Eye	2015, 2017
Clever Dog Lab, Messerli Research Institute, University of Veterinary Medicine Vienna	2013
Family Dog Project, Eötövos University Department of Ethology	2013

PRESENTATIONS

**Denotes presenter*

*Gnanadesikan, G.E., **Bray, E.E.**, Levy, K.M., Douglas, L.E.L.C., Horschler, D.J., Hargrave, S., Kennedy, B.S., Watowich, M.M., Snyder-Mackler, N., & MacLean, E.L. (2024 June). Characterizing the Heritability of Cognitive and Behavioral Traits across Development in Domestic Dogs. Animal Behavior Society 2024 Meeting, Warder Clyde Allee Competition Symposium, London, Ontario, Canada.

***Bray, E.E.**, Zheng, Z., Tolbert, M.K., McCoy, B.M., Kaeberlein, M., Kerr, K.F., Raichlen D.A., Forsyth, K.K., Promislow, D.E.L., Alexander, G.E., MacLean, E.L., & Dog Aging Project Consortium (2024 June). Associations between lifestyle factors and canine cognitive function: Results from the Dog Aging Project. The 4th Canine Science Conference, Seattle, Washington.

*Hargrave, S., **Bray, E.E.**, McGrath, S., Alexander, G.E., Block, T.A., Chao, N., Darvas, M., Douglas, L.E.L.C., Galante, J., Kennedy, B.S., Kusick, B., Moreno, J.A., Promislow, D.E.L., Raichlen, D.A., Switzer, L.R., Tees, L., Underwood Aguilar, M., Urfer, S.R., Dog Aging Project Consortium, & MacLean, E.L. (2024 June). Characterizing Dog Cognitive Aging Using Spontaneous Problem Solving Measures: Development of a Battery of Tests from the Dog Aging Project. The 4th Canine Science Conference, Seattle, Washington.

***Bray, E.E.**, Douglas, L.E.L.C., Gnanadesikan, G.E., Horschler, D.J., Kennedy, B.S., Levy, K.M., & MacLean, E.L. (2024 April). Mothers matter: How early life experiences influence canine cognition and behavior. The 31st Annual International Conference On Comparative Cognition, Albuquerque, New Mexico.

*Gnanadesikan, G.E., **Bray, E.E.**, Levy, K.M., Horschler, D.J., Hargrave, S., Douglas, L.E.L.C., Kennedy, B.S., Watowich, M.M., Snyder-Mackler, N., & MacLean, E.L. (2024 April). Characterizing the heritability of Cognitive and Behavioral Traits Across Development in Domestic Dogs (*Canis lupus familiaris*). The 31st Annual International Conference On Comparative Cognition, Albuquerque, New Mexico.

*Hargrave, S., **Bray, E.E.**, McGrath, S., Alexander, G.E., Block, T.A., Chao, N., Darvas, M., Douglas, L.E.L.C., Galante, J., Kennedy, B.S., Kusick, B., Moreno, J.A., Promislow, D.E.L., Raichlen, D.A., Switzer, L.R., Tees, L., Underwood Aguilar, M., Urfer, S.R., Dog Aging Project Consortium, & MacLean, E.L. (2024 April). Characterizing Dog Cognitive Aging Using Spontaneous Problem Solving Measures: A Battery of Tests from the Dog Aging Project. The 31st Annual International Conference On Comparative Cognition, Albuquerque, New Mexico.

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- *Gnanadesikan, G.E., **Bray, E.E.**, Levy, K.M., Douglas, L.E.L.C., Horschler, D.J., Hargrave, S., Kennedy, B.S., & MacLean, E.L. (2023 Oct). Characterizing the heritability of cognitive and behavioral traits across development in a population of assistance dogs. South Eastern Evolution and Human Behavior 2023 Meeting. Stone Mountain, Georgia.
- ***Bray, E.E.**, Douglas, L.E.L.C., Gnanadesikan, G.E., Horschler, D.J., Kennedy, B.S., Levy, K.M., & MacLean, E.L. (2023 Jan). Effects of early maternal care on puppy behavior and training outcome. #AnimBehav2023 Animal Behaviour Twitter Conference (Virtual). <https://twitter.com/DrEmilyBray/status/1616146051735629824>
- ***Bray, E.E.** & ManyDogs (2023 Jan). ManyDogs Project: Leveraging big team science to understand canine behavior and cognition. #AnimBehav2023 Animal Behaviour Twitter Conference (Virtual). <https://twitter.com/ManyDogsProject/status/1616163665442664453>
- ***Bray, E.E.**, Douglas, L., Gnanadesikan, G.E., Horschler, D.J., Levy, K.M., Kennedy, B.S., & MacLean, E.L. (2022 October). Effects of early rearing environment on working dog puppy behavior and outcome. Canine Science Conference, Colgate University, Hamilton, New York.
- *Gnanadesikan, G.E., Tandon, D., **Bray, E.E.**, MacLean, E.L., & vonHoldt, B.M. (2022 October). Do dogs have Williams-Beuren Syndrome? Transposons, behavior & training success in assistance dogs. Canine Science Conference, Colgate University, Hamilton, New York.
- ***Bray, E.E.**, Raichlen, D.A., Forsyth, K., Promislow, D.E.L., Alexander, G.E., & MacLean, E.L. (2022 September). Associations between physical activity and cognitive dysfunction in older companion dogs: results from the Dog Aging Project. Dog Aging Project Annual Meeting, Seattle, Washington.
- *Gnanadesikan, G.E., Tandon, D., **Bray, E.E.**, MacLean, E.L., & vonHoldt, B.M. (2022 July). Do dogs have Williams-Beuren Syndrome? Transposons, behavior & training success in assistance dogs. Animal Behavior Society 2022, San Jose, Costa Rica.
- Bray, E.E.**, Raichlen, D.A., *Forsyth, K., Promislow, D.E.L., Alexander, G.E., MacLean, E.L., & Dog Aging Project Consortium (2022 June). Physical activity is associated with better cognitive function: Results from the Dog Aging Project. American College of Veterinary Internal Medicine Forum, Austin, Texas.
- ***Bray, E.E.** (2022 April). The effect of maternal care on the outcomes of working dog puppies. 2022 Penn Vet Working Dog Conference (Virtual meeting).
- ***Bray, E.E.**, Gnanadesikan, G.E., Horschler, D.J., Levy, K.M., Kennedy, B.S., Famula, T.R., & MacLean, E.M. (2021 Oct). Development and heritability of cognitive traits in Canine Companions dogs. International Working Dog Conference 2021 (Virtual meeting).
- Bray, E.E.**, Levy, K.M., *Kennedy, B.S., & MacLean, E.L. (2021 Oct). The effect of maternal style on later puppy behavior in Canine Companions dogs. International Working Dog Conference 2021 (Virtual meeting).
- ***Bray, E.E.** (2021 Sept). Making the Grade: Development of Cognition and Temperament in Assistance Dogs. 2021 Assistance Dogs International Virtual Conference.
- ***Bray, E.E.** (2021 July). RStudio Projects and RMarkdown. Dog Aging Project, Trainees Research in Project (TRIP) Meeting (Virtual).
- ***Bray, E.E.** (2021 April). Continuing to explore the effects of mothering style in future assistance dogs. East Coast Canine Cognition Workshop, Yale University (Virtual meeting).
- *Gnanadesikan, G.E., **Bray, E.E.**, MacLean, E.L., & vonHoldt, B.M (2021 April). Williams-Beuren Syndrome in Dogs? Genetic Variation, Social Behavior, and Assistance Dog Success. East Coast Canine Cognition Workshop, Yale University (Virtual meeting).

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- *Horschler, D.J., **Bray, E.E.**, & MacLean, E.L. (2021 April). Interpreting dogs' re-engagement behaviors after disrupted joint activities. East Coast Canine Cognition Workshop, Yale University (Virtual meeting).
- *Horschler, D.J., **Bray, E.E.**, & MacLean, E.L. (2021 Feb). Do dogs form joint intentions with humans in social play? The Society for Personality and Social Psychology's Origins of the Social Mind Preconference (Virtual meeting).
- ***Bray, E.E.**, Gnanadesikan, G.E., Horschler, D.J., & MacLean, E.L. (2021 Jan). Heritable variation in dog social cognition. #AnimBehav2021 Animal Behaviour Twitter Conference (Virtual). <https://twitter.com/DrEmilyBray/status/1354554832749645826>
- *Gnanadesikan, G.E., Espinosa, J.H., & **ManyDogs** (2021 Jan). ManyDogs 1: An International Collaborative Approach to Pointing Comprehension in Domestic Dogs. #AnimBehav2021 Animal Behaviour Twitter Conference (Virtual). <https://twitter.com/ManyDogsProject/status/1354550089918767105>
- ***Bray, E.E.** & MacLean, E.L. (2020 July). Early ontogeny of social cognition in domestic dogs. Animal Behavior Society 2020 Virtual Conference.
- ***Bray, E.E.**, Gnanadesikan, G.E., Horschler, D.J., & MacLean, E.L. (2020 Feb). Early development and longitudinal stability of cognitive traits in working dogs. East Coast Canine Cognition Workshop, Yale University, New Haven, Connecticut.
- *Byrne, M., **Bray, E.E.**, MacLean, E.L., & Johnston, A.M. (2020 Feb). Evidence for win-stay-lose-shift in puppies and adult dogs. East Coast Canine Cognition Workshop, Yale University, New Haven, Connecticut.
- *Horschler, D.J., **Bray, E.E.**, & MacLean, E.L. (2020 Feb). Do dogs re-engage humans when joint experiences end? East Coast Canine Cognition Workshop, Yale University, New Haven, Connecticut.
- *MacLean, E.L., Gnanadesikan, G., **Bray, E.E.**, & Snyder-Mackler, N. (2020 Jan). Dog diversity as a natural experiment in cognitive evolution. The Society for Integrative & Comparative Biology Annual Meeting, Austin, Texas.
- *MacLean, E.L., **Bray, E.E.**, Gnanadesikan, G.E., & Horschler, D.J. (2019 Oct). Ontogeny and heritability of cognitive and temperamental traits in an assistance dog population. International Canine Science Conference, Tempe, Arizona.
- ***Bray, E.E.**, Gnanadesikan, G., Horschler, D., & MacLean, E. (2019 April). Early emerging cognition in 9-week-old puppies. The 26th International Conference On Comparative Cognition, Melbourne Beach, Florida.
- *MacLean, E., **Bray, E.E.**, Gnanadesikan, G., & Horschler, D. (2019 April). Heritability of Cognitive Traits in a Pedigreed Dog Population. The 26th International Conference On Comparative Cognition, Melbourne Beach, Florida.
- ***Bray, E.E.** (2018 Nov). How mothers matter: The impact of maternal style on later behavior and outcome in assistance dogs. East Coast Canine Cognition Workshop, Yale University, New Haven, Connecticut.
- ***Bray, E.E.**, Sammel, M., Cheney, D., Serpell, J., & Seyfarth, R. (2017 Oct). The effects of maternal investment, temperament, & cognition on guide dog success. Canine Science Conference, Tempe, Arizona.
- ***Bray, E.E.**, Sammel, M., Cheney, D., Serpell, J., & Seyfarth, R. (2017 June). Puppies that succeed as guide dogs get tough love. 54th Annual Conference of the Animal Behavior Society, Toronto, Ontario.
- ***Bray, E.E.**, Sammel, M., Cheney, D., Serpell, J., & Seyfarth, R. (2016 Aug). Cognitive and temperament predictors of guide dog success. 53rd Annual Conference of the Animal Behavior Society, Columbia, Missouri.
- ***Bray, E.E.** (2014 Aug). The effect of arousal on inhibitory control in dogs. 51st Annual Conference of the Animal Behavior Society, Princeton, New Jersey.
- ***Bray, E.E.** (2013 Aug). Dogs as a model system for understanding the effect of arousal on inhibitory control. University of Pennsylvania, 699 presentations to the Department of Psychology. Philadelphia, Pennsylvania.

Emily E. Bray

***Bray, E.E.** (2012 Sept). What are the factors affecting inhibitory control in dogs? IGERT Common Ground Seminar. Philadelphia, Pennsylvania.

***Bray, E.E., MacLean, E.L., & Hare, B.A.** (2012 April). Factors Affecting Inhibitory Control in Dogs. 7th Annual ACC Meeting of the Minds Conference, Blacksburg, Virginia.

POSTERS

**denotes undergraduate mentee*

Leung, M.C.K., Conrow, K.D., Haney, R., Su, Y., Snyder-Mackler, N., Kerr, K.F., Promislow, D., Albright, J., & **Bray, E.E.** (2024 July). Demography and Health History of Dogs with Cannabidiol and Hemp Use in the Dog Aging Project. Poster presented at the Research Society of Marijuana 8th Annual Scientific Meeting, Toronto, Ontario, Canada.

Persoon-Hilby, E., Tseng, A., Norton, E., Block, T., **Bray, E.E.**, Kennedy, B., Mickelson, J., Jacob, S., & McCue, M. (June 2024). Heritability of impactful assistance dog behaviors for children with autism informed by family needs. 12th International Conference of Canine and Feline Genetics and Genomics 2024, Little Finlandia, Helsinki, Finland.

Leung, M.C.K., Conrow, K.D., Haney, R., Su, Y., Snyder-Mackler, N., Kerr, K.F., Promislow, D., & **Bray, E.E.** (2024 March). Demography and Health History of Dogs with Cannabidiol and Hemp Use in the Dog Aging Project. Poster presented at Society of Toxicology Annual Meeting, Salt Lake City, Utah.

Leung, M.C.K., Conrow, K.D., Haney, R., Snyder-Mackler, N., Kerr, K.F., Promislow, D., & **Bray, E.E.** (2023 September). Demography of Dogs with Cannabidiol and Hemp Use in the Dog Aging Project. Poster presented at Environmental Mutagenesis & Genomics Society Meeting, Chicago, Illinois.

Bray, E.E., Zheng, Z., Tolbert, M.K., McCoy, B., Dog Aging Project Consortium, Kaerberlein, M., & Kerr, K.F. (2021 December). Once-daily feeding is associated with better cognitive function and health in companion dogs: Results from the Dog Aging Project. Poster presented at The Role of Companion Animals as Sentinels for Predicting Environmental Exposure Effects on Aging and Cancer Susceptibility in Humans: A Hybrid Workshop, Washington, D.C. & Virtual.

Bray, E.E., Zheng, Z., Tolbert, M.K., McCoy, B., Dog Aging Project Consortium, Kaerberlein, M., & Kerr, K.F. (2021 November). Once-daily feeding is associated with better cognitive function and health in companion dogs: Results from the Dog Aging Project. Poster presented at Dog Aging Project Semi-Annual Meeting, Virtual.

Byrne, M., **Bray, E.E., MacLean, E.L., & Johnston, A.M.** (2020 July). Evidence for win-stay-lose-shift in puppies and adult dogs. Poster presented at the 42nd Annual Meeting of the Cognitive Science Society, Virtual.

Kennedy, B.S., Levy, K.M., **Bray, E.E., & MacLean, E.L.** (2019 September). Maternal style: How early experiences are associated with future outcomes of assistance dogs. Poster presented at 11th International Working Dog Conference, Stockholm, Sweden.

*Humphrey, E., **Bray, E., & Crocker, D.** (2019 April). Cortisol and its tie to behavior in service dogs. Poster presented at Sonoma State University Science Symposium: Science, Technology, and Environmental Inquiry, Rohnert Park, California.

*Seely, A., **Bray, E., & Seyfarth, R.** (2014 September). Flexible Attention in Seeing Eye® Puppies. Poster presented at Center for Undergraduate Research & Fellowships Open House and Research Expo, Philadelphia, Pennsylvania.

MacLean, E.L., Rainey, C., **Bray, E., Duffy, K., & Hare, B.** (2012 July). Cognitive & Temperamental Traits of Successful Assistance Dogs. Poster presented at 21st Annual Conference of the International Society of Anthrozoology, Cambridge, United Kingdom.

Bray, E.E., MacLean, E.L., & Hare, B.A. (2012 June). Factors Affecting Inhibitory Control in Dogs. Poster presented at 49th Annual Conference of the Animal Behavior Society, Albuquerque, New Mexico.

Bray, E.E., MacLean, E.L., & Hare, B.A. (2012 April). Factors Affecting Inhibitory Control in Dogs. Poster presented at Duke's Visible Thinking Day, Durham, North Carolina.

Emily E. Bray

Bray, E.E. (2011 April). Recommendations for an English Language Learner Literacy Intervention in Durham Public Schools for Communities in Schools of Durham. Poster presented at Duke School Research Partnership End-of-Semester gathering poster presentation. Durham, North Carolina.

RESEARCH EXPERIENCE

Canine Companions for Independence, Santa Rosa, CA <i>Project coordinator, researcher, on-site supervisor</i>	2017 - 2023
The Seeing Eye, Inc., Morristown, NJ <i>Project coordinator and researcher</i>	2014 - 2016
Michigan State University Masai Mara Spotted Hyena Project, Kenya <i>Researcher</i>	Summer 2013
Canine Companions for Independence, Santa Rosa, CA <i>Project Co-Manager, Associate in Research in Evolutionary Anthropology</i>	July 2012
K2 Solutions, Pinehurst, NC <i>Associate in Research in Evolutionary Anthropology</i>	June 2012
Canine Companions for Independence, Santa Rosa, CA <i>Undergraduate researcher</i>	August 2011
Duke University, School Research Partnership Office, Durham, NC <i>Independent study student</i>	Spring 2011
Duke University, Duke Canine Cognition Center, Durham, NC <i>Undergraduate researcher and thesis student</i>	2010 - 2012

TEACHING AND MENTORING EXPERIENCE

Undergraduate Honors Theses Supervised

Chandler From University of Arizona	<i>The effect of vertical nursing on cognitive test scores in 8-week-old puppies</i>	2020
Camden Olson Princeton University	<i>Service Dog Tales: A Tri-fold Study Investigating Diabetic Alert Dog Accuracy, the Use of Animal-Assisted Therapy to Address Executive Functioning Skills, and the Function of Calming Signals in Service Dog Puppies</i>	2018
Sarah Frommer University of Pennsylvania	<i>Does Kennel Acclimation Reliably Indicate Stable Traits Related to Stress Reactivity In Young Seeing Eye® Dogs?</i>	2016
Molly Ream University of Pennsylvania	<i>Stability of Behavioral Traits in Canines</i>	2016

Master's Capstone Projects Supervised

Chandler From Unity College	<i>The Dog Aging Project: A Pilot Study on Cognitive Aging in Companion Dogs</i>	2022
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Dissertation Committee Member

Courtney Sexton George Washington University	<i>What is Written on a Dog's Face? Implications of Phenotype Diversity in Human-directed Canine Communication</i>	2023
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University of Arizona Veterinary Summer Scholars Research Program: Mentor

Alyssa Houle	Summer 2024
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Canine Companions Research Interns: Mentor and on-site supervisor

Angelina Schirle	Fall 2022 – Spring 2023
Kayla Gilbert, Alessandra Ostheimer, and Angelina Schirle	Spring/Summer 2022
Theresa Hatcher (Sonoma State University)	Spring 2020
Kyla Guinon, Erin Hardin, and Emily Humphrey (Sonoma State University)	Spring 2019
Alexzia Clark, Emily Humphrey, Facundo Ortega, and Camila Risueno-Pena (Sonoma State University)	Fall 2018
Alexzia Clark, Emily Humphrey, and Amber Robello (Sonoma State University)	Spring 2018

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Undergraduate Research Assistants: Mentor and on-site supervisor

Rachel Shaberman (UC Davis)	2021
Camden Olson (Princeton)	2018
Mary Chiang (Franklin & Marshall)	2017
Lindsey Lang (University of Arizona)	2017
Sarah Frommer (University of Pennsylvania)	2015-2016
Molly Ream (University of Pennsylvania)	2015-2016
Rebecca Schwartz (University of Pennsylvania)	2015-2016
Leonie Cohen (Swarthmore College)	2015
Marie Torres (University of Pennsylvania)	2014
Stephanie Bartner (Franklin & Marshall)	2014
Ashleigh Seely (University of Pennsylvania)	2014

University of Pennsylvania Mentoring

The Graduate School Mentoring Initiative	2014 - 2015
The Penn Mentoring Program	2013 - 2014

Teaching assistant

Animal Behavior, Dr. Seyfarth and Cheney, University of Pennsylvania	Fall 2013, Fall 2014
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Guest Lectures

<i>Canine Cognition Seminar</i> Barnard College, Psychology (Virtual) Invited guest speaker	2024
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<i>Psychology Lecture Series</i> The University of Arizona Osher Lifelong Learning Institute "Setting the dog-human relationship up for success: Understanding behavioral and cognitive traits in dogs"	2024
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<i>Applied Companion Animal Behavior in Practice</i> University of Arizona, Animal & Biomedical Sciences (Virtual) "Development and heritability of behavioral and cognitive traits in dogs"	2023, 2024
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<i>Introduction to Animal Science</i> Oregon State University, Department of Animal and Rangeland Science (Virtual) "From puppies to assistance dogs"	2021
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<i>Human-Animal Bond Class</i> University of Pennsylvania, School of Veterinary Medicine (Virtual) "Ontogeny and heritability of behavioral and cognitive traits in dogs"	2021
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<i>Field Studies in Animal Behavior: Dog Cognition and Behavior</i> Hunter College, Psychology Department (Virtual) "Research methods to study canine behavior and cognition"	2020
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<i>Animal Cognition Seminar</i> University of Pennsylvania, Psychology Department "How can dog research help us to understand inhibitory control?"	2014
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<i>Animal Behavior</i> University of Pennsylvania, Psychology Department "How can dog research help us to understand inhibitory control?"	2013, 2014
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Alumni community reader for the Duke Reader Project

Psy 202: Research Methods	Fall 2020
Bio 329L: Principles of Animal Physiology	Spring 2020

Emily E. Bray

Psy 301: Research Methods Spring 2017

Tutoring experience

Thompson Writing Program: The Writing Studio, Durham, NC 2010 - 2012
Undergraduate Writing Tutor following completion of a semester-long course
 Partners for Success, Durham, NC (4th grade) Fall 2011
Tutored as part of my service-learning course Psy 108A: Educational Psychology
 The Duke School, Durham, NC (pre-school) Spring 2011
Student Observer for Psy 183B: Child Observation
 Partners for Youth, Durham, NC (high school) 2008 - 2009

PROFESSIONAL SERVICE, DEVELOPMENT, AND AFFILIATIONS

Morris Animal Foundation's FY25 Canine Scientific Advisory Board 2024-2025

Canine Science Conference Scientific Committee 2024

Invited grant and awards reviewer
University of Arizona Outstanding Postdoctoral Scholar Award 2024
American Kennel Club Canine Health Foundation grants 2022
The Leakey Foundation grants 2021
University of Arizona Postdoctoral Research Development grants 2020
Animal Behavior Society student research grants 2019

Speaker application review panelist for Penn Vet Working Dog Conference 2022

Ad Hoc reviewer ([see Publons for verified peer reviews](#)) 2014 – Present

Animal Behavior and Cognition
Animal Behaviour
Animal Cognition
Applied Animal Behaviour Science
Behaviour
Behavioural Processes
Hormones and Behavior
Journal of Applied Animal Welfare Science
Journal of Comparative Psychology
Journal of Ethology
Journal of Veterinary Behavior: Clinical Applications and Research
Learning & Behavior
PLOS One
Proceedings of the Royal Society B: Biological Sciences
Royal Society Open Science
Science
Scientific Reports
Veterinary Record

Weaving the Future of Animal Behavior, Animal Behavior Society 2021
Professional Development workshop for early career animal behavior scientists

Dog Aging Project
Research Team member 2020 – Present
Science Seminar Committee member 2022 – 2023

ManyDogs consortium (*founding member*)
Assistant Director: Community Building and Network Expansion 2022 – Present
ManyDogs1: Methods Development Committee & Team Captain 2019 – 2022

Emily E. Bray

Organized “Topics in Animal Behavior” graduate seminar, University of Pennsylvania

Spring 2014, 2015, 2016

Society membership

Canine Science Society

2024 - Present

American Psychological Association

2021 - Present

Comparative Cognition Society

2020 - Present

The International Society of Anthrozoology

2017 - Present

Animal Behavior Society

2012 - Present

PUBLIC SCIENTIFIC ENGAGEMENT (SELECTED EXAMPLES)

Research Bites Podcast. #10 - Emily Bray - Cognitive development, puppies, service dogs.

<http://bit.ly/41kUY42>

March 2023

Dog Aging Project Blog. Scientific Results: Associations between physical activity and cognitive dysfunction in older companion dogs. <https://bit.ly/3D50a2N>

Oct 2022

PetAbility Podcast. “Canine Cognition with Emily Bray, PhD.” <https://bit.ly/3Lv51wV>

Sept 2022

Dog Aging Project Blog. Scientific Results: Once-daily feeding is associated with better health in companion dogs. <https://bit.ly/3Q9YiK3>

June 2022

Dog Aging Project April Pack Event: Canine Cognition. <https://bit.ly/3xNGXAp>

April 2022

Dog Aging Project Blog. Meet Dr. Emily Bray, Canine Cognition Expert and Puppy Wrangler! <https://bit.ly/3zKzDX5>

March 2022

Spaces Unleashed Sci-Chat with Dr. Emily Bray, Puppy Researcher. <https://bit.ly/3rWfed4>

Feb 2022

Dogged Justice Podcast. “Cognitive Research With Puppies featuring Guest Emily Bray.” <https://apple.co/3B3ZyXe>

Oct 2021

The Animal Behavior Podcast. Two-Minute Takeaway (Season 1, Episode 9). <https://bit.ly/3FFtY5m>

Oct 2021

The Science Pawdcast. “Puppy Pointing with Dr. Emily Bray.” <https://apple.co/3iPO6IN>

Aug 2021

Quirks and Quarks, CBC Radio. “New study shows puppies are born able to understand and communicate with humans.” <https://bit.ly/3zkTfyH>

June 2021

Scientific American 60-Second Science Podcast. “Puppies Understand You Even at a Young Age, Most Adorable Study of the Year Confirms.” <https://bit.ly/3g6QNmB>

June 2021

K9s Talking Scents Podcast. “The mind of a puppy with Dr. Emily Bray.” <http://bit.ly/2PetnLC>

March 2021

The Functional Breeding Podcast. “Maternal Care in Dogs.” <http://bit.ly/36jTjlh>

Jan 2021

Canine Companions for Independence, Facebook Live event.

“Join Canine Companions postdoctoral research associate Dr. Emily Bray.” <https://bit.ly/2yIlyMV>

May 2020

Continuing Education event presented as part of the 2019 VetVine Webinar Series sponsored by AKC Canine Health Foundation. “How Mothers Matter: The Influence of Early Maternal Interaction on Offspring Behavior and Development.” <http://bit.ly/2QscPDb>

May 2019

Top of Mind with Julie Rose, BYU Radio. “What dogs teach us about parenting.” <https://bit.ly/3nDuQkc>

Sept 2017

All Things Considered, National Public Radio. “Coddled puppies make poor guide dogs, study suggests.” <http://n.pr/2uA1vrS>

Aug 2017

Emily E. Bray

Quirks and Quarks, CBC Radio. “Puppies that get tough love succeed as guide dogs.” <http://bit.ly/2i7oTMC> **Aug 2017**

AAAS Science Update. “Guide Dog Success.” <http://bit.ly/2uQpa8n> **Aug 2017**

POPULAR MEDIA COVERAGE (SELECTED EXAMPLES)

Cimons, M (2/11/2024). My pets have stolen my heart again and again. I know I’m not alone. *The Washington Post Well+Being*. <https://bit.ly/4bOWnWN>

Bennet, M (2/7/2024). Why Do Dogs Wag Their Tails? It Might Be Because Humans Love Rhythm. *Discover Magazine*. <https://bit.ly/3W4g4Vf>

Coleman, J (1/16/2024). Some mysteries remain about why dogs wag their tails. *ScienceNews*. <https://bit.ly/4319T5O>

Pappas, S (8/22/2023). Can dogs use language? *Scientific American*. <https://bit.ly/45Sg5gm>

Ogden, LE (7/26/2022). Inside the brains of aging dogs. *Knowable Magazine*. <https://bit.ly/3zTRESZ>

Osborne, H (11/16/2021). Dogs Fed Once Per Day Appear to Have Better Health and Cognitive Function, Study Finds. *Newsweek*. <https://bit.ly/3oRxIJo>

The World According to Jeff Goldblum (11/12/2021). S02 E01: Dogs. *Disney+*.

Woodward, A (9/16/2021). Recent discoveries reveal how dogs are hardwired to understand and communicate with people — even at birth. *Business Insider*. <https://bit.ly/3kjpokJ>

Carroll, L (6/4/2021). Pup’s looking at you, kid: Puppies can understand human cues from very young age. *NBC News*. <https://nbcnews.to/3zaUQH0>

LaMotte, S (6/3/2021). Puppies are born ready to interact with people, study finds. *CNN*. <https://cnn.it/3vT7Wqz>

Fox, A (6/3/2021). Puppies Are Born Ready to Communicate With Humans. *Smithsonian Magazine*. <https://bit.ly/3w1Gp6c>

Grimm, D (3/17/2021). These adorable puppies may help explain why dogs understand our body language. *Science*. <https://bit.ly/3kWFVLy>

Perez, G (8/9/2017). “Tough love” from mom makes a better guide dog, study finds. *CBS This Morning*. <http://cbsn.ws/2wHOyhe>

Woodward, A (8/7/2017). Over-mothered puppies more likely to fail guide dog training. *New Scientist*. <https://bit.ly/3CDr5PV>

Wilhelm, M (8/7/2017). Pick Better Guide Dogs By Watching Hours of Cute Puppy Videos. *Wired*. <https://bit.ly/32mquWq>

Guglielmi, G (8/7/2017). Coddled puppies make poor guide dogs, as this adorable video shows. *Science*. <https://bit.ly/2uQh7sr>

Casey, M (7/22/2015). Too much stress sends some dogs into a tailspin. *CBS News*. <https://cbsn.ws/3nADwb0>

COMMUNITY SCIENCE OUTREACH

Students as Peers participant with Animal Cognition and Behaviour course (University of Rijeka) **March 2021**
- Corresponded with students and answered questions about one of my first-author papers.

Canine Companions for Independence, National Puppy Program Workshop **Oct 2020**
- Presented research involving assistance dogs and participated in a Q + A with Canine Companions puppy raisers

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- American Association of University Women (AAUW) Girls in Engineering, Math, and Science (GEMS) **Jan 2019**
- Presented my research to and participated in a panel discussion for the local AAUW GEMS group.
- Interactive research presentations to elementary school children
- Penn Alexander School (3rd grade; part of “Women in Science” unit) **March 2017**
 - Ashley Park PreK-8 School (2nd grade) **Jan 2014**
 - Central Park School for Children (1st grade) **Aug 2012**