Pablo León-Villagrá

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Research Interests

Empirical research and computational modeling of the development of higher-level cognition, with an emphasis on human representation-learning and generalization in function learning, categorization, and causal learning.

Education

2015–2020	**Ph.D. University of Edinburgh** Thesis Title: Representational Principles of Function Generalization Supervisor: Prof. Dr. Christopher Lucas
2012–2015	**M.Sc. Cognitive Science, University of Osnabrück** Thesis Title: Causal Reasoning and the Markov Assumption in a Physical Microworld Thesis Grade: 1.0 (A), Overall Grade: 1.0 (Distinction) Supervisors: Prof. Dr. Frank Jäkel, Prof. Dr. David Lagnado
2010–2011	**New Bulgarian University** Semester abroad
2008–2013	**B.Sc. Cognitive Science, University of Osnabrück** Thesis Title: Categorization in Chess Thesis Grade: 1.0 (A), Overall Grade: 1.2 (Distinction) Supervisor: Prof. Dr. Frank Jäkel

Academic & Research Experience

2021–today	**Postdoctoral Research Associate, Brown University, USA** Work at Daphna Buchsbaum's Computational Cognitive Development Lab
2020–2021	**Research Fellow, University of Warwick, UK** Project: Searching for the approximation method used to perform rational inference by individuals and groups.
2019–2020	**Visiting Ph.D. student in Daphna Buchsbaum's Computational Cognitive Development Lab, University of Toronto, Canada** Six–month visit during which I ran developmental studies in categorization.
2019	**Participant at the Diverse Intelligences Summer Institute, University of St. Andrews, UK.** A month-long summer institute hosting lectures and projects regarding issues of computational, social and comparative cognition.
2018–2019	**Tutor for Informatics Research Review, University of Edinburgh, UK** Tutoring informatics master students in writing a research review and structuring their research projects.
2016-2019	**TA, Tutor, Demonstrator & Marker for Introduction to Cognitive Science, University of Edinburgh, UK**
2018–2019	**TA, Tutor & Marker for Computational Cognitive Science, University of Edinburgh, UK** Developing materials for the tutorials in R. Tutoring and marking an undergraduate-level class in computational modeling.
2016–2019	**TA, Tutor, Demonstrator & Marker for Introduction to Cognitive Science, University of Edinburgh, UK** Developing materials for course exercises, labs and assignments in Python. Tutoring and demonstrating an introductory course in Cognitive Science.
2017	**Internship at the Alan Turing Institute, London, UK** During the three-month internship I developed and implemented a prototype app to allow citizen engagement through interactive explanations.
2014	**Research Assistant in Frank Jäkel's Cognitive Modeling Group, University of Osnabrück, Germany** Developing, programming, running and analyzing human categorization experiments.
2014	**Research Internship at Dave Lagnado's Causal Cognition Lab, University College London, UK** Three-month visit during which I developed experimental designs and researched causal cognition.
2013–2014	**Tutor for Multivariate Statistics, University of Osnabrück, Germany** Tutoring psychology master students in multivariate statistics. Supervision of theoretical and SPSS exercises.

Publications

Pablo Leon Villagra, Lucas Castillo, Nick Chater, and Adam Sanborn. "Eliciting Human Beliefs using Random Generation". In: *Proceedings of the Annual Meeting of the Cognitive Science Society*. 2022.

Lucas Castillo, Pablo León-Villagrá, Nicholas Chater, and Adam Sanborn. "Local Sampling with Momentum Accounts for Human Random Sequence Generation". In: *Proceedings of the Annual Meeting of the Cognitive Science Society*. Vol. 43. 43. 2021.

Adam Sanborn, Jian-Qiao Zhu, Jake Spicer, Joakim Sundh, Pablo León-Villagrá, and Nick Chater. "Sampling as the Human Approximation to Probabilistic Inference". In: *Human-Like Machine Intelligence*. Ed. by Stephen Muggleton and Nicholas Chater. Oxford: Oxford University Press, 2021. Chap. 10, pp. 430–448.

Jianqiao Zhu, Pablo León-Villagrá, Nick Chater, and Adam Sanborn. "Understanding the Structure of Cognitive Noise". In: *PsyArXiv e-prints* (2021).

Nick Chater, Jian-Qiao Zhu, Jake Spicer, Joakim Sundh, Pablo León-Villagrá, and Adam Sanborn. "Probabilistic biases meet the Bayesian brain". In: *Current Directions in Psychological Science* 29.5 (2020), pp. 506–512.

Pablo León-Villagrá, Kay Otsubo, Christopher G Lucas, and Daphna Buchsbaum. "Uncovering Category Representations with Linked MCMC with people". In: *Proceedings of the 42nd Annual Conference of the Cognitive Science Society* (2020).

Pablo León-Villagrá, Verena S. Klar, Adam N. Sanborn, and Christopher G Lucas. "Exploring the Representation of Linear Functions". In: *Proceedings of the 41st Annual Conference of the Cognitive Science Society* (2019).

Pablo León-Villagrá and Christopher G Lucas. "Generalizing Functions in Sparse Domains". In: *Proceedings of the 41st Annual Conference of the Cognitive Science Society* (2019).

Pablo León-Villagrá, Sarwar Islam, Megan Lucero, Brooks Paige, and Tomas Petricek. "You Guessed it! Reflecting on Preconceptions and Exploring Data without Statistics". In: *Proceedings of the 2nd European Data and Computational Journalism Conference*. University College Dublin. 2018, p. 11.

Pablo León-Villagrá, Irina Preda, and Christopher G Lucas. "Data Availability and Function Extrapolation". In: *Proceedings of the 40th Annual Conference of the Cognitive Science Society* (2018).

Alexander Matthews, Mark Van Der Wilk, Tom Nickson, Keisuke Fujii, Alexis Boukouvalas, Pablo León-Villagrá, Zoubin Ghahramani, and James Hensman. "GPflow: A Gaussian Process Library using TensorFlow". In: *The Journal of Machine Learning Research* 18.1 (2017), pp. 1299–1304.

Pablo León-Villagrá and Frank Jäkel. "Categorization and Abstract Similarity in Chess". In: *Proceedings of the 35th Annual Conference of the Cognitive Science Society* (2013).

Presentations

2022	**Poster**: Uncovering Children's Category Representations 2021 Cognitive Development Society conference
2021	**Poster**: Recovering human category structure across development using sparse judgments 43rd Annual Meeting of the Cognitive Science Society (virtual)
	Poster: Sampling Associations with (Un)related Suggestions 43rd Annual Meeting of the Cognitive Science Society (virtual)
	Poster: Recovering human category structure across development using sparse judgments Conference of the Society for Mathematical Psychology (virtual)
	Talk: Recovering human category structure across development using sparse judgments Concepts in Action: Representation, Learning and Application workshop (virtual)
	Poster: Uncovering Category Representations with Markov Chain Monte Carlo with children Budapest CEU Conference on Cognitive Development (virtual)
2020	**Talk:** Uncovering the development of categories with MCMC with children Developmental Brown Bag Seminar Series, Brown University (virtual)
	Poster: Exploring category structure in children and adults 42nd Annual Meeting of the Cognitive Science Society (virtual)
2019	**Talk:** Generalizing Functions in Sparse Domains XI. Dubrovnik Conference on Cognitive Science
	Talk: Human Function Generalization MIT-IBM Research
2018	**Talk:** Data Availability and Function Extrapolation 14th Biannual conference of the German Society for Cognitive Science Best Presentation Award
2017	**Poster:** Identifying Causal Direction in the Two-Variable Case 39th Annual Meeting of the Cognitive Science Society
	Talk: Human-like Function Learning and Transfer Colloquium of the Institute of Cognitive Science
2016	**Poster:** Human-Like Function Learning and Transfer Human-Like Computing Machine Intelligence Workshop
2015	**Talk:** Kausales Denken - Bayesianische Modelle im Dialog mit der Wiener'schen Denkpsychologie Symposium: Oswald Wiener: Selbstbeobachtung - Denkpsychologie, Austria
	Poster: Categorization in Chess Interdisciplinary College, Möhnesee-Günne

Scholarships

2015–2018	**Ph.D. Scholarship** School of Informatics, Institute for Language, Cognition and Computation

Technical Skills

Skills	Bayesian Methods, Machine Learning, Deep Learning, Full stack web development
Languages	Actionscript, JavaScript, MATLAB, Node, Python, R, Scala, SQL, SPSS, TEX
Tools	Git, GPy, GPFlow, Inkscape, Markdown, React, Psychtoolbox, PsychoPy, PyMC3, PyTorch, Stan, scikit-learn

Languages

German	Mother tongue
Spanish	Mother tongue
English	Fluent