

# Guillermo Puebla

## Curriculum Vitae

Quebec 439

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### Professional experience

- 2023–present **Assistant Professor**, *Instituto de Alta Investigación*, Universidad de Tarapacá, Chile.
- 2023–present **Research Associate**, *Centro Nacional de Inteligencia Artificial*, Chile.
  - 2023 **Postdoctoral Associate**, *Centro Nacional de Inteligencia Artificial*, Chile.
  - 2021–2022 **Postdoctoral Associate**, *University of Bristol*, United Kingdom.

### Education

- 2022 **PhD, Psychology**, *University of Edinburgh*, United Kingdom.
- 2018 **MSc. Psychology**, *University of Edinburgh*, United Kingdom.
- 2015 **MPhil. Psychology**, *University of Queensland*, Australia.
- 2008 **BSc. Psychology**, *Universidad de Tarapacá*, Chile.

### Research interests

Analogy and relational reasoning; artificial neural networks; categorization and causal reasoning; the cognitive basis of culture; heuristic and deliberative reasoning.

### Publications

#### Preprints

1. Puebla, G. & Bowers, J. S. (2024). Visual Reasoning in Object-Centric Deep Neural Networks: A Comparative Cognition Approach arXiv:2402.12675.
2. Puebla, G., & Doumas, L. A. (2022). Learning Relational Rules from Rewards. arXiv:2203.13599.

#### Journal articles

1. Fong, F. T. K., Puebla, G. & Nielsen, M. (2024). The Role of Conventionality and Design in Children's Function Judgments About Malfunctioning Artifacts. *Journal of Experimental Child Psychology*, 240, 105835.
2. Bowers, J. S., Malhotra, G., Adolphi, F. G., Dujmović, M., Montero, M. L., Biscione, V., Puebla, G., Hummel, J. & Heaton, R. F. (2023). On the importance of severely testing deep learning models of cognition. *Cognitive Systems Research*, 82, 101158.
3. Bowers, J. S., Malhotra, G., Dujmović, M., Montero, M. L., Tsvetkov, C., Biscione, V., Puebla, G., Adolphi, F., Hummel, J. E., Heaton, R., Evans, B. D., Mitchell, J. & Blything, R. (2023). Clarifying status of DNNs as models of human vision. *Behavioral and Brain Sciences*, 46, e415.

4. Bowers, J. S., Malhotra, G., Dujmović, M., Montero, M. L., Tsvetkov, C., Biscione, V., Puebla, G., Adolphi, F., Hummel, J. E., Heaton, R., Evans, B. D., Mitchell, J. & Blything, R. (2023). Deep Problems with Neural Network Models of Human Vision. *Behavioral and Brain Sciences*, 46, e385.
5. Puebla, G. & Bowers, J. S. (2022). Can deep convolutional neural networks support relational reasoning in the same-different task? *Journal of Vision*, 22(11), 1-18.
6. Dumas, L. A. A., Puebla, G., Martin, A. E., & Hummel, J. E. (2022). A theory of relation learning and cross-domain generalization. *Psychological Review*, 129(5), 999–1041.
7. Puebla, G., Martin, A. E. & Dumas, L. A. (2021). The relational processing limits of classic and contemporary neural network models of language processing. *Language, Cognition and Neuroscience*, 36(2), 240-254.
8. Chaigneau, S. E., Puebla, G. & Canessa, E. C. (2016). Why the designer's intended function is central for proper function assignment and artifact conceptualization: Essentialist and normative accounts. *Developmental Review*, 41, 38-50.
9. Puebla, G. & Chaigneau, S. E. (2014). Inference and coherence in causal-based artifact categorization. *Cognition*, 130(1), 50-65.
10. Chaigneau, S. E. & Puebla, G. (2013). The Proper Function of Artifacts: Intentions, Conventions and Causal Inferences. *Review of Philosophy and Psychology*, 4(3), 391-406.

### **Conference proceedings**

1. Biscione, V., Yin, D., Malhotra, G., Dujmović, M., Montero, M. L., Puebla, G., Adolphi, F. G., Tsvetkov, C., Heaton, R. F., Hummel, J., Evans, B. D. & Bowers, J. S. (2023). Introducing the MindSet benchmark for comparing DNNs to human vision. *2023 Conference on Cognitive Computational Neuroscience*.
2. Puebla, G. & Bowers, J. S. (2023). The role of object-centric representations, guided attention, and external memory on generalizing visual relations. *2023 Conference on Cognitive Computational Neuroscience*.
3. Puebla, G. & Bowers, J. S. (2021). Can Deep Convolutional Neural Networks Learn Same-Different Relations? *Proceedings of the 43rd Annual Meeting of the Cognitive Science Society*, 1747-1752.
4. Dumas, L. A., Puebla, G., Martin, A. E. & Hummel, J. E. (2020). Relation learning in a neurocomputational architecture supports cross-domain transfer. *Proceedings of the 42nd Annual Meeting of the Cognitive Science Society*, 932-937.
5. Dumas, L. A., Puebla, G., Hummel, J. E. & Martin, A. E. (2019). Predicate learning via neural oscillations supports one-shot generalization between video games. *2019 Conference on Cognitive Computational Neuroscience*.
6. Puebla, G. & Chaigneau, S. E. (2019). A Piecemeal Processing Strategy Model for Causal-Based Categorization. *Proceedings of the 41st Annual Virtual Meeting of the Cognitive Science Society*, 2613-2619.
7. Puebla, G., Dumas, L. A. & Martin, A. E. (2019). The relational processing limits of classic and contemporary neural network models of language processing. *2019 Conference on Cognitive Computational Neuroscience*.

8. Dumas, L. A., Hamer, A., Puebla, G. & Martin, A. E. (2017). A theory of the detection and learning of structured representations of similarity and relative magnitude. *Proceedings of the 39th annual conference of the cognitive science society, 1955-1960*.
9. Puebla-Ramírez, G. & Chaigneau, S. (2011). Is the Centrality of Design History Function an Effect of Causal Knowledge? *Proceedings of the 33rd Annual Meeting of the Cognitive Science Society, 1533-1538*.

## Grants

- 2024-2027 **Proyecto FONDECYT de Iniciación No. 11241282**, *3D Symmetry Perception and Shape Constancy in Infants and Deep Neural Networks*, Principal Investigator: Guillermo Puebla.
- 2022-2024 **Proyecto FONDECYT regular No. 1220664**, *El rol del procesamiento heurístico y deliberativo de la información, la receptividad y el escepticismo ingenuo, en la susceptibilidad a la desinformación en el ámbito de la salud*, Principal Investigator: Rodrigo Ferrer Urbina; Colaborators: Guillermo Puebla, Daniel Pérez-Zapata, Herman Elgueta, Marcos Carmona.
- 2019-2022 **Proyecto FONDECYT regular No. 1190006**, *A descriptive model of causal-based categorization*, Co-Investigador, Principal Investigator: Sergio Chaigneau; Colaborators: Guillermo Puebla, Daniel Pérez-Zapata, Enrique Canessa.

## Ad hoc reviewer

*Cognition; Journal of Experimental Psychology: Learning, Memory, and Cognition; Philosophical Transactions of the Royal Society B; Cognitive Science; PLOS ONE; Annual Conference of the Cognitive Science Society.*

## Media Coverage

- 2021 Pavlus, J. Same or Different? The Question Flummoxes Neural Networks. *Quanta Magazine*

## Scholarships

- 2018 International Doctoral Scholarship, Becas Chile.  
2015 International Masters Scholarship, Becas Chile.

## Languages

Español **Native**  
Inglés **Advanced**

## Software

Python, Keras, PyTorch, R,  $\text{\LaTeX}$