

Mauricio González-Forero

Tuesday 25th March, 2025

<https://mauriciogforero.github.io>

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Education

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| 2007-2013 | PhD in Ecology and Evolutionary Biology University of Tennessee, Knoxville, USA. Thesis: Evolution of acquiescence to manipulation. Advisor: Sergey Gavrilets. In addition to Biology modules, I took the following 6 postgraduate modules in Mathematics and Statistics: Mathematical Ecology I-II, Mathematical Evolutionary Theory, Stochastic Modelling (Markov Chains), and Statistical Inference I-II. |
| 1999-2006 | BSc in Biology (and the equivalent of a minor in Mathematics) University of Antioquia, Medellín, Colombia. Thesis: Species: a mathematical formalization. Advisors: Luís Fernando Echeverri (mathematics), Joao Muñoz (biology), and Ricardo Callejas (biology). In addition to Biology modules, I took the following 10 modules in Mathematics and Physics: Calculus I-III, Linear Algebra, Multilinear Algebra, Ordinary Differential Equations, Vectorial Geometry, Mathematical Logic, Set Theory, and Physics I. |

Research positions

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| 2018-Feb 2024 | Research Fellow (i.e., postdoc) Supervisor: Andy Gardner. University of St Andrews, UK. |
| 2020-2021 | \approx 3.8 months of furlough due to increased childcare responsibilities during the COVID pandemic. Overall, I estimate the pandemic delayed my work by \approx 7 months. |
| 2016-2018 | Marie Skłodowska-Curie Individual Fellow Supervisor: Andy Gardner. University of St Andrews, UK. |
| 2013-2016 | Postdoctoral researcher Supervisor: Laurent Lehmann. University of Lausanne, Switzerland. |
| 2010-2012 | Graduate research associate Funded by the National Institute of Mathematical and Biological Synthesis (NIM-BioS). University of Tennessee, Knoxville, USA. |

Teaching positions

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| 2018-2019, 2023 | Guest lecturer Designed and gave 1 lecture on Brain evolution: comparative neuroanatomy and controversies (3rd year Evolution course). Gave 3 lectures on Social Evolution (3rd year Evolution course). Also essay setting, marking, and providing feedback (2nd and 3rd Evolution modules). University of St Andrews, UK. |
| 2013-2016 | Teaching assistant Grading master-student projects, mentoring students in the Experimental Design course, and assisting exercise sections of the Population Genetics course. University of Lausanne, Switzerland. |
| 2010 | In charge of a full course Designed and gave all lectures, exams, and grading of the semester-long course. Course: Mathematics for Life Sciences. Approx. 30 students from majors including Medicine and Psychology. University of Tennessee, Knoxville, USA. |
| 2007-2009 | Graduate teaching assistant Teaching wet lab sections of the courses Biology, Genetics, and Mathematics for Life Sciences. University of Tennessee, Knoxville, USA. |

Preprints

González-Forero M, Gómez-Robles A. Evidence that human skill level is more reactive to developmental history than to genes or environment. Submitted. Preprint: <https://www.biorxiv.org/content/10.1101/2025.03.17.643651v1>.

Riffe T, Villavicencio F, **González-Forero M**. Sensitivity and decomposition of multistate healthy life expectancy. In review at *Demography*. Preprint: <https://dx.doi.org/10.4054/MPIDR-WP-2024-014>.

Peer-reviewed publications

My publication strategy focuses on quality rather than quantity. I thus encourage judgement of my publications by their content rather than their numbers.

González-Forero M, Gómez-Robles A. Why did the human brain size evolve? A way forward. In press at *Phil. Trans. B*. Preprint: <https://doi.org/10.32942/X2T62W>.

González-Forero M. (2024) Evolutionary-developmental (evo-devo) dynamics of hominin brain size. *Nature Human Behaviour*. 8, 1321–1333. Open access. <https://www.nature.com/articles/s41562-024-01887-8>.

González-Forero M. (2024) A mathematical framework for evo-devo dynamics. *Theoretical Population Biology*. 155, 24-50. Open access. <https://www.sciencedirect.com/science/article/pii/S0040580923000758>.

González-Forero M. (2023) How development affects evolution. *Evolution*. 77, 562-579. Open access. <https://academic.oup.com/evolut/article/77/2/562/6955321>.

***González-Forero M**, *Peña J. (2021) Eusociality through conflict dissolution. *Proc. R. Soc. B*. 288, 20210386. Open access. <https://royalsocietypublishing.org/doi/10.1098/rspb.2021.0386>. *Equal contribution.

González-Forero M, Gardner A. (2018) Inference of ecological and social drivers of human brain-size evolution. *Nature* 557, 554-557. <https://www.nature.com/articles/s41586-018-0127-x>.

Accessible PDF: <https://rdcu.be/O1Vc>.

González-Forero M, Faulwasser T, Lehmann L. (2017) A model for brain life history evolution. *PLoS Computational Biology* 13, e1005380. Open access. <https://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1005380>.

González-Forero M. (2015) Stable eusociality via maternal manipulation when resistance is costless. *Journal of Evolutionary Biology* 28, 2208-2223. <https://academic.oup.com/jeb/article/28/12/2208/7412264>. Accessible PDF: <https://mauriciogforero.github.io/FullJEB15.pdf>.

González-Forero M. (2014) An evolutionary resolution of manipulation conflict. *Evolution* 68, 2038-2051. <https://academic.oup.com/evolut/article/68/7/2038/6852554>. Accessible PDF: <https://mauriciogforero.github.io/FullEvolution14.pdf>.

González-Forero M, Gavrillets S. (2013) Evolution of manipulated behavior. *American Naturalist* 182, 439-451. <https://www.journals.uchicago.edu/doi/10.1086/671932>. Accessible PDF: <https://mauriciogforero.github.io/AmNat13.pdf>.

González-Forero M. (2009) Removing ambiguity from the biological species concept. *Journal of Theoretical Biology* 256, 76-80. <https://www.sciencedirect.com/science/article/abs/pii/S002251930800489X>. Accessible PDF: <https://mauriciogforero.github.io/FullJTB09.pdf>.

Research Grants, Awards, and Honours

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| | Total awarded (at current exchange rates): £210k. |
| 2016-2018 | Marie Skłodowska-Curie Individual Fellowship (€ 195,000) Project title: Brain growth under social pressure: mathematical modelling of brain growth when individuals face social challenges. Awarded by the EU European Commission. |
| 2010-2012 | Graduate Research Assistantship (US\$ 40,000) Project title: Evolution of eusociality mediated by maternal induction. Awarded by the USA National Institute for Mathematical and Biological Synthesis, NIMBioS. |
| 2009 | Santa Fe Institute Complex Systems Summer School (US\$ 550) Awarded by the Santa Fe Institute, Santa Fe, NM, USA |
| 2006 | Undergraduate thesis award Thesis title: "Species: a mathematical formalization". Awarded by the Faculty of Natural and Exact Sciences, University of Antioquia, Colombia. |
| 2005 | Third place in the National Biology Exam (ECAES) Exam for all undergraduates in Colombia. Awarded by the Ministry of Education, Colombia. |

Consultancy

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| 2023-2025 | Private consultancy (€ 20,000) Sensitivity of human life expectancy to perturbation. University of Basque Country, Spain. |
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Invitations

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| 2025 | Invitation to workshop Invited to the Volkswagen Foundation Scoping Workshop “Building a framework to integrate diverse routes to adaptation in a changing world” organised by Melanie Dammhahn, Niels Dingemanse, Pim Edelaar, Sam Patrick, Denis Réale, and Alastair Wilson. Hannover, Germany. |
| | Invited talk Willem Frankenhuis lab meeting. University of Amsterdam. Online. |
| 2024 | Invited talk School of Psychology & Neuroscience, University of St Andrews, UK. |
| | Invited talk Symposium Connecting Macro and Micro Evolution of Form and Function Relationships at the Evolution Conference, Montreal, Canada (given virtually). |
| | Invited talk Royal Society meeting “Natural Selection Shapes Animal Cognition” in Bath, UK, organised by Elli Leadbeater and Alex Thornton. |
| | Invited paper Special issue of <i>Philosophical Transactions of the Royal Society B</i> “Natural Selection Shapes Animal Cognition”. |
| 2023 | Invited talk Institute Seminar. Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany. |
| | Invited talk Roberto Salguero-Gómez lab meeting, Department of Biology, University of Oxford, UK. Online. |
| | Invited talk Applied Mathematics Seminar series, School of Mathematics & Statistics, University of St Andrews, UK. |
| 2022 | Invited talk Research Away Day, School of Biology, University of St Andrews, UK. |
| 2020 | Invited talk Institute for Advanced Studies, Toulouse, France. Online due to pandemic. |
| 2019 | Invited talk Evolutionary Anthropology Research Group, Department of Anthropology, Durham University, UK. |
| | Invited talk Applied Mathematics Seminar series, School of Mathematics & Statistics, University of St Andrews, UK. |
| 2018 | Invited talk Stochastic Models for the Inference of Life Evolution group at the Collège de France in Paris. |
| 2017 | Invited talk Department of Zoology, University of Cambridge. |
| | Invited talk Department of Human Behavior, Ecology and Culture at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany. |
| 2016 | Invited talk Centre for Biological Diversity, School of Biology, the University of St Andrews, UK. |
| 2015 | Invited talk Department of Evolutionary Theory, Max Planck Institute for Evolutionary Biology, Plön, Germany. |

Organised workshops and symposia

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| 2020 | Co-organiser of Fellowship writing workshop for the School of Biology. 10 speakers from the University of St Andrews. University of St Andrews, UK. |
| 2019 | Co-organiser of the symposium "Life history evolution: bridging theory and data". Congress of the European Society for Evolutionary Biology (ESEB2019), Turku, Finland. |

University administration experience

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| 2022-2024 | Postdoctoral representative of the School of Biology for the Institute of Behavioural and Neural Sciences (IBANS), University of St Andrews. |
| 2019-2021 | Postdoctoral representative for the Biology Equality and Diversity Committee, School of Biology, University of St Andrews. |

Reviewer for

American Naturalist, Biological Reviews, Bulletin of Mathematical Biology, eLife, Evolution, Evolution Letters, Journal of Evolutionary Biology, Journal of Theoretical Biology, Nature, Nature Communications, Nature Ecology and Evolution, PLoS ONE, Proceedings of the Royal Society B, Science Advances, Theoretical Population Biology.

Grants reviewed for

Research Foundation - Flanders (Belgium).

Active society memberships

Society for Modeling & Theory in Population Biology.

Contributed conference presentations

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| 2024 | Virtual talk. Conference of Australasian Society for Human Biology. |
| | Virtual talk. Evolution conference. |
| 2022 | Talk. Mathematical Models in Ecology and Evolution conference. Reading, UK. |
| | Talk. Euro Evo-Devo. Naples, Italy. |
| | Talk. Population Genetics Group. Online. |
| 2021 | Talk. Evolution conference. Online. |
| 2019 | Talk. Mathematical Models in Ecology and Evolution conference. Lyon, France. |
| | Talk. European Human Behaviour and Evolution Association conference. Toulouse, France. |
| 2018 | Talk. Models in Population Dynamics, Ecology, and Evolution conference. Leicester, UK. |
| 2017 | Talk. European Human Behaviour and Evolution Association conference. Paris, France. |
| 2016 | Talk. Institute of Behavioural and Neural Sciences mini symposium. St Andrews, UK. |
| | Talk. European section of International Union for the Study of Social Insects conference. Helsinki, Finland. |
| | Talk. Swiss Biology '16 conference. Lausanne, Switzerland. |

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| 2015 | 2 posters. European Society for Evolutionary Biology conference. Lausanne, Switzerland. |
| | Talk. Mathematical Models in Ecology and Evolution conference. Paris, France. |
| | Poster. 3rd Economics and Biology Workshop of the Institute of Advanced Study. Toulouse, France. |
| 2012 | Talk. Society for Mathematical Biology conference. Knoxville, TN, USA. |
| | Talk. Evolution conference. Ottawa, Canada. |
| 2011 | Talk. Evolution conference. Norman, OK, USA. |
| 2010 | Talk. Biocompleti ^{XI} conference: The evolution of cooperation. Bloomington, IN, USA. |
| 2007 | Talk. South Eastern Population Ecology and Evolutionary Genetics meeting. Tremont, TN, USA. |
| 2005 | Poster. European Conference on Mathematical and Theoretical Biology. Dresden, Germany. |

Attended workshops and Summer schools

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| 2017 | 2 workshops. Mean field games, and Numerical methods for optimal control problems. Sapienza University. Rome, Italy. |
| 2015 | Workshop. 3rd Economics and Biology Workshop, Institute for Advanced Study. Toulouse, France. |
| 2014 | Workshop. Social evolution: merits and limitations of inclusive fitness theory. Arolla, Switzerland. |
| 2010-2012 | Working group. Large scale demographic, network and behavioral trait analyses of sociality. Four meetings at National Evolutionary Synthesis Center, Durham, USA. |
| 2009 | Summer Program. Mathematical Biosciences Institute Summer Graduate Program. Columbus, OH, USA. |
| | Complex Systems Summer School. Santa Fe Institute. Santa Fe, NM, USA. |
| 2004 | Workshop. Bases in Studies of Entomologic Diversity in Ibero-America. Quito and Yasuni National Park (in the Amazon rainforest), Ecuador. |

Additional funding

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| 2015 | Travel grant. €500 by the Institute for Advanced Study, Toulouse, France to attend the Institute's 3rd Economics and Biology Workshop. |
| 2012 | Travel grants. US\$1000 by the National Institute of Mathematical and Biological Synthesis and US\$350 by the Department of Ecology and Evolutionary Biology, University of Tennessee, Knoxville to attend the Evolution conference in Ottawa, Canada. |
| 2011 | Travel grants. US\$500 by the National Institute of Mathematical and Biological Synthesis, US\$200 by the Graduate Researchers in Ecology, Behavior and Evolution of UTK, and US\$200 by the Department of Ecology and Evolutionary Biology to attend the Evolution conference in Norman, OK, USA. |
| 2010 | Travel grants. US\$400 by the workshop committee and US\$500 by the National Institute of Mathematical and Biological Synthesis to attend Biocompleti ^{XI} . |
| | Travel grant. US\$650 by NIMBioS to visit Gro Amdam and James Hunt at Arizona State University. |
| 2009 | Travel grant and stipend. US\$400 of travel support and a stipend of US\$300 by the Mathematical Biosciences Institute to attend their Summer Graduate Program. |

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| | Travel grant. US\$800 by the Department of Ecology and Evolutionary Biology of the University of Tennessee, Knoxville, to attend the Santa Fe Institute Summer School and the Mathematical Biosciences Institute Summer Program. Declined. |
| 2005 | Undergraduate thesis improvement grant. \approx US\$30 by the Research Development Committee (CODI) of the University of Antioquia. |
| 2004 | Travel grant. US\$1040 by the Society for Mathematical Biology and €950 by the European Society of Mathematical and Theoretical Biology to attend the European Conference on Mathematical and Theoretical Biology and the Society of Mathematical Biology conference in Dresden, Germany. |

Non-peer-reviewed publications

González-Forero M. (2018) The human brain from ecology and seemingly culture. Behind the paper blog post at *Nature Ecology and Evolution Community*. <https://communities.springernature.com/posts/the-human-brain-from-ecology-and-seemingly-culture>.

González-Forero M. (2018) Why do humans have such large brains? Our study suggests ecology was the driving force. *The Conversation*.
<https://theconversation.com/why-do-humans-have-such-large-brains-our-study-suggests-ecology-was-the-driving-force-96873>.

Selected media coverage

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| 2024 | Helsingin Sanomat. https://www.hs.fi/tiede/art-2000010573820.html . PNAS journal club. https://www.pnas.org/post/journal-club/model-humans-got-their-big-brains-stirs-interest-and-controversy . |
| 2023 | I F*cking Love Science, among others. https://www.iflscience.com/we-may-finally-know-why-humans-have-such-big-brains-70453 . |
| 2021 | Brain evolution work featured in article by Science Illustrated (Sweden). |
| 2019 | Article by the European Commission research press. https://ec.europa.eu/research-and-innovation/en/projects/success-stories/all/why-humans-have-very-big-brains . Article by Discover Magazine. State of Science: Finding Human Ancestors in New Places. https://www.discovermagazine.com/planet-earth/state-of-science-finding-human-ancestors-in-new-places . |
| 2018 | Interviewed by The Associated Press (USA), the AFP (France), New Scientist (UK), Dagens Nyheter (Sweden), LA Times (USA), Vox (USA), La Vanguardia (Spain), TBS eFM Radio (Korea), Weekendavisen (Denmark), among others. Article by the Associated Press. Study offers new look at why our brains evolved to be so big. https://apnews.com/7fe4e81cbb114ee2adf42c6e49f19b45/Study-offers-new-look-at-why-our-brains-evolved-to-be-so-big . Article by LA Times. Can simulating evolution on a computer explain our enormous brains? http://www.latimes.com/science/sciencenow/la-sci-sn-human-brain-evolution-20180523-story.html . Article by Vox. Why do humans have such huge brains? https://www.vox.com/science-and-health/2018/5/23/17377200/human-brain-size-evolution-nature . Article by New Scientist. We may have got the evolution of our big brains entirely wrong. https://www.newscientist.com/article/2169862-we-may-have-got-the-evolution-of-our-big-brains-entirely-wrong/ . Radio interview by TBS eFM Radio This Morning program (Korea). http://cdn.podbbang.com/data1/tbsadm/thism180529002.mp3 . |

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| 2017 | Interviewed by PBS Newshour (USA). Why did humans evolve big brains? We don't know, but math can help. http://www.pbs.org/newshour/rundown/humans-evolve-big-brains-dont-know-math-can-help/ . |
| | ScienceDaily. How big brains evolved could be revealed by new mathematical model. https://www.sciencedaily.com/releases/2017/03/170309142339.htm . |
| | EOS Wetenschap. Wiskundig model helpt de evolutie van grote breinen beter begrijpen. https://www.eoswetenschap.eu/psyche-brein/wiskundig-model-helpt-de-evolutie-van-grote-breinen-beter-begrijpen . |
| | ANSA Scienza&Tecnica. Un modello matematico ricostruisce l'evoluzione dei grandi cervelli. http://www.ansa.it/canale_scienza_tecnica/notizie/fisica_matematica/2017/03/10/un-modello-matematico-ricostruisce-l'evoluzione-dei-grandi-cervelli-_1be94a2f-bcb9-43d5-a0ea-e70c8e7d6e46.html . |
| 2013 | Nature World News. How manipulation becomes altruism: a study. http://www.natureworldnews.com/articles/3548/20130820/manipulation-becomes-altruism-study.htm . |
| | Business Standard. Altruism may have origins in manipulation. http://www.business-standard.com/article/news-ani/altruism-may-have-origins-in-manipulation-113082000973_1.html . |
| | Science World Report. The evolution of manipulation: altruism created by manipulated behaviour. http://www.scienceworldreport.com/articles/8899/20130819/evolution-manipulation-altruism-created-manipulated-behavior.htm . |
| | Der Standard. Manipulation könnte Wurzel für selbstloses Verhalten sein. http://derstandard.at/1376533943228/Manipulation-koennte-Wurzel-fuer-selbstloses-Verhalten-sein . |