

Curriculum Vitae: Robert Francis Lachlan

Department of Biology, Duke University, Box 90338, Durham, NC 27708 USA
Tel: +1 919 3603666 e-mail: rfl5@duke.edu Nationality: British

Academic background:

- 2007-present** Duke University, USA. Postdoctoral research associate: *Modelling sexual selection and cultural evolution of bird song* – with Prof. Stephen Nowicki.
- 2004-2007** Leiden University, Netherlands. Postdoctoral research associate: *Modelling cultural evolution. A parallel investigation of changes in bird song and human language* – NWO (Dutch version of NSF) funded research project.
- 2002-2004** University of North Carolina at Chapel Hill, USA: Postdoctoral research associate: *Theoretical investigations into speciation and learning* – with Prof. Maria Servedio.
- 1999-2002** Leiden University, Netherlands: E.U. Marie Curie Postdoctoral fellowship: *Gene-culture coevolution and vocal communication in Canary Island chaffinches* (*Fringilla coelebs*) – with Prof. Carel ten Cate
- 1996-1999** University of St. Andrews, UK: PhD: *Cultural evolution in bird song, in theory and in chaffinches* (*Fringilla coelebs*) Supervised by Prof. Peter Slater
- 1993-1996** King's College, University of Cambridge, UK: BA (Hons), 1st class, Zoology

Scholarships, Awards & Grants:

- 2004-2007** NWO (Dutch government) grant (joint principal author): Evolution & Behaviour program (postdoc & PhD student)
- 2000-2002** Marie Curie Postdoctoral Fellowship (E.U.: 5th framework; Cat. 30): research project with Prof. C. ten Cate (postdoc)
- 1996-1999** BBSRC PhD studentship
- 1996** J. Arthur Ramsay Summer Scholarship (University of Cambridge) produced ref. 23.
- 1995** ASAB grant & Balfour-Brown Scholarship (Univ. of Cambridge) produced ref. 22.

Teaching experience:

- Lectures:** Introductory and upper-level undergraduate courses in Behaviour (Leiden University).
- Tutorials:** Implemented undergraduate tutorials in behavioural biology course; taught tutorials in behavioural biology, evolutionary biology (Leiden University, University of St. Andrews).
- Practicals:** Wrote a computer simulation to demonstrate recent models of sympatric speciation, for a Masters course in evolutionary ecology (<http://website.leidenuniv.nl/~lachlanrf/Simulation.html>). Assisted with Behavioural Observation practical in Behaviour course.
- Seminars:** Supervisor in "Evolution and Human Behaviour" seminar course (moderating and leading discussion).
- Design:** Designed and carried out a Bioacoustics "mini-course"; helped design Behaviour course (Leiden University).
- Research:** Co-supervised a PhD student in Leiden University Linguistics dept (Frank Landsbergen). Supervised 4 Masters level research projects (Leiden University). Designed and taught short undergraduate research projects in Animal Behaviour (Leiden University, St. Andrews University)

Seminars & invited conference presentations:

Invited talks: "Evolution of flexible communication", Konrad Lorenz Institute, Austria, 2005;
"Scottish-Dutch Workshop on Language Evolution", Amsterdam University, 2005;
"Cultural Evolution", University of British Columbia, 2007.

Invited departmental seminars: Bielefeld, Groningen, UNC Chapel Hill, Copenhagen, Stanford.
Reviewed talks at numerous international conferences (ISBE, ABS, IEC, ASAB).

Technical and Specialized Skills:

Bioacoustics: expert on recording and playback (in lab and field), and analysis using software (Avisoft, Praat, etc.); have written acoustic comparison, and grammar induction software.

Experimental design and implementation: both with lab and field experiments (with insects, fish and birds). I conceived and organized group field expeditions (with responsibility for two assistants) to Spain and Portugal, including arranging research and export permits.

Theoretical biology: designed models of evolution ranging from deterministic *population genetics models* to computational *individual-based spatial simulations*.

Programming: fluent in Java programming language – have written fully featured spatially explicit simulations; genetic and cultural evolutionary simulations; game theoretical simulations as well a bioacoustics package that makes use of the MySQL database system; and implements acoustical, data-mining, and statistical algorithms.

Research Software Written:

Luscinia (<http://luscinia.sourceforge.net>): a complete bioacoustics analysis package. Offers an innovative approach to measuring bioacoustical signals, organizing recordings in databases, and analytical and statistical methods that are adapted from recent advances in computational linguistics and data mining. Since being recently completed, Luscinia is currently being used in a growing number (currently around 10) of projects around the world.

Sympatric speciation simulation (<http://website.leidenuniv.nl/~lachlanrf/Simulation.html>): an online program that replicates and extends the well-known Dieckman & Doebeli model of sympatric speciation. Designed to be used as a teaching resource for speciation biology (see also ref. 15 below).

Tintillon (available upon request): a spatial simulation program of cultural evolution of bird song, with a detailed graphical UI (see also ref. 14 below).

Publications:

- 1) * Lachlan, R.F., Verzijden, M.N., Bernard, C.S., Koese, B., Jonker, P.-P. (*In prep.*) Progressive evolutionary loss of song syntax in a colonization chain.
- 2) * Lachlan, R.F. & Nowicki, S. (*In prep.*) The role of the developmental stress hypothesis in shaping song learning and syntax.
- 3) den Hartog, P., Lachlan, R.F. and ten Cate, C. (*In prep.*) Avian vocal variation in one generation: F1 hybrids similar to individuals from a natural hybrid zone.
- 4) * Lachlan, R.F., Verhagen, L., Peters, S. and ten Cate, C. (*Submitted*) The existence of natural categories in bird song. *Ethology*.
- 5) Brumm, H., Lachlan, R.F., Riebel, K.; and Slater, P.J.B. (*Submitted*) On the function of song type repertoires: testing the 'anti-exhaustion hypothesis' in chaffinches. *Animal Behaviour*.
- 6) Holveck, M.-J.; Vieira de Castro, A.; Lachlan, R.F.; ten Cate, C.; Riebel, K. (*Provisionally accepted*) Accuracy of song syntax learning and singing consistency signal early condition in zebra finches. *Behavioural Ecology*.
- 7) ** Landsbergen, F.; Lachlan R.F.; ten Cate, C.J. and Verhagen, A. (*Provisionally accepted*) A cultural evolutionary of patterns in semantic change. *Linguistics*.

- 8) * Lachlan R.F. (*In Press*) The evolution of flexibility in bird song. In: "Contextual flexibility in communication" Griebel U. & Oller, K. (Eds). MIT Press, Cambridge, USA.
- 9) ** Verzijden M.N., Lachlan R.F. & Servedio M.R. (2005) Female mate choice behaviour and sympatric speciation. *Evolution* 59: 2097-2108
- 10) * Lachlan R.F. (2005) Bird song dialects. In: "The Encyclopedia of Language and Linguistics" 2nd Edition K. Brown (ed). Elsevier, Oxford UK, p. 538.
- 11) ** Terry A.M.R. and Lachlan R.F. (2005) Communication networks in a virtual world: a theoretical perspective. In: "Communication networks" P.K.McGregor (ed). Oxford University Press, Oxford UK
- 12) * Lachlan R.F. and Servedio M.R. (2004) Song learning accelerates allopatric speciation. *Evolution* 58: 2049-2063.
- 13) * Lachlan R.F.; Janik V.M. and Slater P.J.B. (2004) The evolution of conformity enforcing behaviour in cultural communication systems. *Animal Behaviour* 68: 561-570.
- 14) * Lachlan R.F. and Slater P.J.B. (2003) Song learning by chaffinches: how accurately and from where? *Animal Behaviour* 65: 957-969.
- 15) ** Slater P.J.B. and Lachlan R.F. (2003) Is innovation in bird song adaptive? In: "The biology of innovation" Laland, K.N. and Reader, S. (eds). Oxford University Press, Oxford UK: 117-136.
- 16) * Lachlan R.F. and Feldman M.W. (2003) Evolution of cultural communication systems: the coevolution of cultural signals and genes encoding learning preferences. *Journal of Evolutionary Biology* 16: 1084-1095.
- 17) * Katz M. and Lachlan R.F. (2003) Social learning of food types in zebra finches (*Taeniopygia guttata*) is directed by demonstrator sex and feeding activity. *Animal Cognition* 6: 11-16.
- 18) Benskin C.M.H, Mann N.I., Lachlan R.F., and Slater, P.J.B. (2002) Social learning directs feeding in the zebra finch (*Taeniopygia guttata*). *Animal Behaviour* 64: 823-828.
- 19) Slater P.J.B., Lachlan R.F., Riebel K. (2000) The significance of learning in signal development: the curious case of the chaffinch. In: *Animal Signals. Adaptive significance of signalling and signal design in animal communication*. Espmark Y., Amundsen T. and Rosenqvist G. (eds). Tapir Publishers, Trondheim, Norway. 401-413.
- 20) * Lachlan R.F. (1999) Cultural evolution of bird song, in theory and in chaffinches (*Fringilla coelebs*). PhD Thesis, University of St. Andrews.
- 21) * Lachlan R.F. and Slater P.J.B. (1999) The maintenance of vocal learning by gene-culture interaction: the cultural trap hypothesis. *Proceedings of the Royal Society of London B* 266: 701-706.
- 22) Hoffmeister T.S., Lachlan R.F. and Roitberg B.D. (1999) Do larger fruits provide a partial refuge for rose-hip flies against parasitoids? *Journal of Insect Behaviour* 12: 451-460.
- 23) * Lachlan R.F., Crooks L and Laland K.N. (1998) Who follows whom? Shoaling preferences and social learning of foraging information in guppies *Animal Behaviour* 56: 181-190.

Publications marked * represent those in which I was the principal co-author (i.e. I made the largest contribution to the paper). Publications marked ** represent those in which I was the joint principal co-author with one other co-author.

References:

Prof. Steve Nowicki (Current postdoctoral advisor). snowicki@duke.edu, 919-668-3420, Department of Biology, Duke University, Box 90338, Durham, NC 27708 USA
 Prof. Maria R. Servedio (Former postdoctoral advisor). servedio@email.unc.edu, 919-843-2692, CB# 3280, Coker Hall, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599 USA
 Prof. Peter J.B. Slater (PhD advisor). pjbs@st-andrews.ac.uk, +44 1334-463500, Bute Building, University of St. Andrews, Fife, KY16 9TS, UK