References for Part I

L. Altenberg. The Schema Theorem and Price's Theorem. In L. D. Whitley and M. D. Vose, editors, *Foundations of Genetic Algorithms 3*, pages 23–49, Estes Park, Colorado, USA, 31 July–2 Aug. 1994 1995. Morgan Kaufmann.

Lee Altenberg, "The Evolution of Evolvability in Genetic Programming," In Kim Kinnear, editor, *Advances in Genetic Programming.* MIT Press, 1994.

Lee Altenberg, "Emergent phenomena in genetic programming", A. V. Sebald and L. J. Fogel, editors, *Evolutionary Programming — Proceedings of the Third Annual Conference*, pages 233–241, World Scientific Publishing, 1994.

David E. Goldberg. Genetic Algorithms and Walsh Functions: Part I, A Gentle Introduction. *Complex Systems*, 3:129–152, 1989.

D. E. Goldberg. *Genetic Algorithms in Search, Optimization, and Machine Learning.* Addison-Wesley, Reading, Massachusetts, 1989.

J. J. Grefenstette. Deception considered harmful. In L. D. Whitley, editor, *Foundations of Genetic Algorithms 2*, San Mateo, CA, 1993. Morgan Kaufman.

T. Haynes. Phenotypical building blocks for genetic programming. In E. Goodman, editor, *Genetic Algorithms: Proceedings of the Seventh International Conference*, Michigan State University, East Lansing, MI, USA, 19-23 July 1997. Morgan Kaufmann.

J. Holland. *Adaptation in Natural and Artificial Systems.* MIT Press, Cambridge, Massachusetts, second edition, 1992.

J. R. Koza. *Genetic Programming: On the Programming of Computers by Means of Natural Selection.* MIT Press, 1992.

John R. Koza and Riccardo Poli, A Genetic Programming Tutorial, In Edmund Burke, editor. Introductory Tutorials in Optimization and Search Methodologies, Chapter 7. Kluwer, 2003. (40 pages). Forthcoming.

W. B. Langdon and R. Poli, *Foundations of Genetic Programming*, 2002. Springer.

W. B. Langdon and R. Poli, Why Ants are Hard, *Proceedings of the Third International Conference on Genetic Programming, GP'98*, pp. 193-201, Madison, Wisconsin, July 1998. Morgan Kaufmann.

W. B. Langdon and R. Poli, Boolean Functions Fitness Spaces, In R. Poli, P. Nordin, W. B. Langdon and T. Fogarty (Eds.), Proceedings of the Second European Workshop on Genetic Programming – EuroGP'99, Goteborg, May 26–27, 1999, Springer-Verlag, 1999.

William B. Langdon, Terry Soule, Riccardo Poli, and James A. Foster. The evolution of size and shape. In Lee Spector, William B. Langdon, Una-May O'Reilly, and Peter J. Angeline, editors, *Advances in Genetic Programming 3*, chapter 8, pages 163–190. MIT Press, Cambridge, MA, USA, June 1999.

Nicholas F. McPhee and Riccardo Poli, "A schema theory analysis of the evolution of size in genetic programming with linear representations", in *Genetic Programming, Proceedings of EuroGP 2001*, Milan, 18-20 Apr. 2001, LNCS, Springer-Verlag.

Nicholas Freitag McPhee and Riccardo Poli, "Using schema theory to explore interactions of multiple operators," in *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO-2002)*, New York, USA, July 2002, Morgan Kaufmann.

Nicholas F. McPhee, Riccardo Poli, and Jon E. Rowe, "A schema theory analysis of mutation size biases in genetic programming with linear representations", in *Proceedings of the 2001 Congress on Evolutionary Computation CEC 2001*, Seoul, Korea, May 2001.

R. Menke, A revision of the schema theorem, Techn. Rep. CI 14/97 of the Collaborative Research Center SFB 531, University of Dortmund, 1997.

A. E. Nix and M. D. Vose, "Modeling genetic algorithms with Markov chains," *Annals of Mathematics and Artificial Intelligence*, vol. 5, pp. 79–88, 1992.

P. Nordin and W. Banzhaf, "Complexity compression and evolution," in *Genetic Algorithms: Proceedings of the Sixth International Conference (ICGA95)* (L. Eshelman, ed.), (Pittsburgh, PA, USA), pp. 310–317, Morgan Kaufmann, 15-19 July 1995.

P. Nordin, F. Francone, and W. Banzhaf, "Explicitly defined introns and destructive crossover in genetic programming," in *Proceedings of the Workshop on Genetic Programming: From Theory to Real-World Applications* (J. P. Rosca, ed.), (Tahoe City, California, USA), pp. 6–22, 9 July 1995.

P. Nordin, F. Francone, and W. Banzhaf, "Explicitly defined introns and destructive crossover in genetic programming," in *Advances in Genetic Programming 2* (P. J. Angeline and K. E. Kinnear, Jr., eds.), ch. 6, pp. 111–134, Cambridge, MA, USA: MIT Press, 1996.

U.-M. O'Reilly. *An Analysis of Genetic Programming.* PhD thesis, Carleton University, Ottawa-Carleton Institute for Computer Science, Ottawa, Ontario, Canada, 22 Sept. 1995.

U.-M. O'Reilly and F. Oppacher. The troubling aspects of a building block hypothesis for genetic programming. In L. D. Whitley and M. D. Vose, editors, *Foundations of Genetic Algorithms 3*, pages 73–88, Estes Park, Colorado, USA, 31 July–2 Aug. 1994 1995. Morgan Kaufmann.

J. Page, R. Poli, and W. B. Langdon. Smooth uniform crossover with smooth point mutation in genetic programming: A preliminary study. In Riccardo Poli, Peter Nordin, William B. Langdon, and Terence C. Fogarty, editors, *Genetic Programming, Proceedings of EuroGP'99*, volume 1598 of *LNCS*, pages 39–49, Goteborg, Sweden, 26-27 May 1999. Springer-Verlag.

R Poli. 1997. Is Crossover a Local Search Operator? ICGA 97 Workshop on Evolutionary Computation with Variable Size Representations, East Lansing USA July 1997.

R. Poli. Recursive conditional schema theorem, convergence and population sizing in genetic algorithms. In W. M. Spears and W. Martin, editors, *Proceedings of the Foundations of Genetic Algorithms Workshop (FOGA 6)*, Charlottesville, VA, USA, pp. 143–163, July 2000. Morgan Kaufmann.

Riccardo Poli. Schema theorems without expectations. In Wolfgang Banzhaf, Jason Daida, Agoston E. Eiben, Max H. Garzon, Vasant Honavar, Mark Jakiela, and Robert E. Smith, editors, *Proceedings of the Genetic and Evolutionary Computation Conference*, volume 1, page 806, Orlando, Florida, USA, 13-17 July 1999. Morgan Kaufmann.

Riccardo Poli. Schema theory without expectations for GP and GAs with one-point crossover in the presence of schema creation. In Thomas Haynes, William B. Langdon, Una-May O'Reilly, Riccardo Poli, and Justinian Rosca, editors, *Foundations of Genetic Programming*, Orlando, Florida, USA, 13 July 1999.

Riccardo Poli, "Exact schema theory for genetic programming and variable-length genetic algorithms with one-point crossover", *Genetic Programming and Evolvable Machines*, vol. 2, no. 2, pp. 123–163, 2001.

Riccardo Poli, "General schema theory for genetic programming with subtree-swapping crossover", in *Genetic Programming, Proceedings of EuroGP 2001*, Milan, 18-20 Apr. 2001, LNCS, Springer-Verlag.

R. Poli. Hyperschema theory for GP with one-point crossover, building blocks, and some new results in GA theory. In Riccardo Poli, Wolfgang Banzhaf, and *et al.*, editors, *Genetic Programming, Proceedings of EuroGP 2000*. Springer-Verlag, 15-16 April 2000.

R. Poli. Exact Schema Theorem and Effective Fitness for GP with One-Point Crossover. In D. Whitley *et al.*, editors, *Proceedings of the Genetic and Evolutionary Computation Conference*, Las Vegas, July 2000. Morgan Kaufmann.

Riccardo Poli, "Why the Schema Theorem is Correct also in the Presence of Stochastic Effects", *Proceedings of the Congress on Evolutionary Computation (CEC 2000)*, pp. 487–492, San Diego, USA, 6–9 July 2000.

R. Poli, "A Simple but Theoretically-motivated Method to Control Bloat in Genetic Programming", In Conor Ryan, Terrence Soule, Maarten Keijzer, Edward Tsang, Riccardo Poli and Ernesto Costa, editors. *Genetic Programming, Proceedings of the 6th European Conference, EuroGP 2003*, LNCS, pages 211–223, Essex, 14-16 April 2003. Springer-Verlag.

R. Poli and W. B. Langdon, Genetic Programming with one-Point Crossover, *Second On-Line World Conference on Soft Computing in Engineering Design and Manufacturing*, pages 180-189, June 1997. Springer-Verlag London.

R. Poli and W. B. Langdon, A New Schema Theory for Genetic Programming with One-Point Crossover and Point Mutation, *Proceedings of the Second International Conference on Genetic Programming, GP'97*, pp. 278–285, Stanford, July 1997. Morgan Kaufmann.

R. Poli and W. B. Langdon. An Experimental Analysis on Schema Creation, Propagation and Disruption in Genetic Programming, In E Goodman, Ed. *Proceedings of Seventh International Conference on Genetic Algorithms*, pp. 18-25, Michigan State University, East Lansing, USA, July 1997. Morgan Kaufmann.

R. Poli and W. B. Langdon, Schema Theory for Genetic Programming with One-point Crossover and Point Mutation, *Evolutionary Computation Journal*, 6(3): 231–252, 1998.

R. Poli and W. B. Langdon, A Review of Theoretical and Experimental Results on Schemata in Genetic Programming, In W. Banzhaf, R. Poli, M. Schoenauer and T. Fogarty (Eds.), Proceedings of the First European Workshop on Genetic Programming – EuroGP'98, Paris, April 14–15, 1998, LNCS 1391, pp. 1–15, Springer-Verlag, Berlin, 1998.

R. Poli and W. B. Langdon, On the Search Properties of Different Crossover Operators in Genetic Programming, *Proceedings of the Third International Conference on Genetic Programming, GP'98*, pp. 293-301, Madison, Wisconsin, July 1998. Morgan Kaufmann.

R. Poli, W. B. Langdon and U.-M. O'Reilly, Analysis of Schema Variance and Short Term Extinction Likelihoods, *Proceedings of the Third International Conference on Genetic Programming, GP'98*, pp. 284-292, Madison, Wisconsin, July 1998. Morgan Kaufmann.

Riccardo Poli and Nicholas F. McPhee, "Exact schema theory for GP and variable-length GAs with homologous crossover," in *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO-2001)*, San Francisco, California, USA, 7-11 July 2001, Morgan Kaufmann.

Riccardo Poli and Nicholas F. McPhee, "Exact schema theorems for GP with one-point and standard crossover operating on linear structures and their application to the study of the evolution of size", in *Genetic Programming, Proceedings of EuroGP 2001*, Milan, 18-20 Apr. 2001, LNCS, Springer-Verlag.

Riccardo Poli and Nicholas F. McPhee, "Exact schema theory for GP and variable-length GAs with homologous crossover", in *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO-2001)*, San Francisco, California, USA, 7-11 July 2001, Morgan Kaufmann.

Riccardo Poli and Nicholas Freitag McPhee, "Exact GP schema theory for headless chicken crossover and subtree mutation", in *Proceedings of the 2001 Congress on Evolutionary Computation CEC 2001*, Seoul, Korea, May 2001.

Riccardo Poli and Nicholas Freitag McPhee, General Schema theory for genetic programming with subtree-swapping crossover: Part I, *Evolutionary Computation*, 11(1): 53–66, 2003.

Riccardo Poli and Nicholas Freitag McPhee, General Schema theory for genetic programming with subtree-swapping crossover: Part II, —em Evolutionary Computation, 11(2), 2003. (38 pages) Forthcoming.

R. Poli and J. Page. Solving high-order Boolean parity problems with smooth uniform crossover, sub-machine-code GP and demes. *Genetic programming and evolvable machines*, 1:37–56, 2000.

Riccardo Poli, Jonathan Page, and W. B. Langdon. Smooth uniform crossover, sub-machine code GP and demes: A recipe for solving high-order boolean parity problems. In Wolfgang Banzhaf, Jason Daida, Agoston E. Eiben, Max H. Garzon, Vasant Honavar, Mark Jakiela, and Robert E. Smith, editors, *Proceedings of the Genetic and Evolutionary Computation Conference*, volume 2, pages 1162–1169, Orlando, Florida, USA, 13-17 July 1999. Morgan Kaufmann.

Riccardo Poli, Jon E. Rowe, and Nicholas F. McPhee, "Markov chain models for GP and variable-length GAs with homologous crossover," in *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO-2001)*, San Francisco, California, USA, 7-11 July 2001, Morgan Kaufmann.

Riccardo Poli, Jonathan E. Rowe, Christopher R. Stephens and Alden H. Wright, "Allele Diffusion in Linear Genetic Programming and Variable-Length Genetic Algorithms with Subtree Crossover", *Proceedings of the 5th European Conference on Genetic Programming, EuroGP 2002*, LNCS, Vol. 2278, pp. 213–228, Springer-Verlag, 3–5 April 2002.

Riccardo Poli, Christopher R. Stephens, Alden H. Wright, and Jonathan E. Rowe, "On the Search Biases of Homologous Crossover in Linear Genetic Programming and Variable-length Genetic Algorithms", in *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO-2002)*, New York, USA, July 2002, Morgan Kaufmann.

Riccardo Poli, Christopher R. Stephens, Alden H. Wright and Jonathan E. Rowe, "A Schema-theory-based Extension of Geiringer's Theorem for Linear GP and Variable-length GAs under Homologous Crossover". In K. De Jong, R. Poli and J. Rowe, editors, *Proceedings of the Foundations of Genetic Algorithm (FOGA–7) Workshop*, Torremolinos, Spain, 3–5 September 2002, Morgan Kaufmann. Forthcoming.

N. J. Radcliffe. Forma analysis and random respectful recombination. In *Proceedings of the Fourth International Conference on Genetic Algorithms*. Morgan Kaufmann, 1991.

N. J. Radcliffe, "Schema processing," in *Handbook of Evolutionary Computation* (T. Baeck, D. B. Fogel, and Z. Michalewicz, eds.), pp. B2.5–1–10, Oxford University Press, 1997.

J. P. Rosca. Analysis of complexity drift in genetic programming. In J. R. Koza, K. Deb, M. Dorigo, D. B. Fogel, M. Garzon, H. Iba, and R. L. Riolo, editors, *Genetic Programming 1997: Proceedings of the Second Annual Conference*, pages 286–294, Stanford University, CA, USA, 13-16 July 1997. Morgan Kaufmann.

J. P. Rosca and D. H. Ballard. Rooted-Tree Schemata in Genetic Programming. In Lee Spector, William B. Langdon, Una-May O'Reilly, and Peter J. Angeline, editors, *Advances in Genetic Programming 3*, chapter 11, pages 243–271. MIT Press, Cambridge, MA, USA, June 1999.

C. R. Stephens, "Some exact results from a coarse grained formulation of genetic dynamics," in *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO-2001)*, San Francisco, California, USA, 7-11 July 2001, Morgan Kaufmann.

Christopher R. Stephens and Riccardo Poli, EC Theory in Theory: Towards a Unification of Evolutionary Computation Theory, In Anil Menon, editor, *Hilbert challenge problems in Evolutionary Computation*, Kluwer, 2003. (28 pages). Forthcoming.

Christopher R. Stephens, Riccardo Poli, Alden H. Wright, and Jonathan E. Rowe, "Exact Results from a Coarse Grained Formulation of the Dynamics of Variable-length Genetic Algorithms", in *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO-2002)*, New York, USA, July 2002, Morgan Kaufmann.

C. R. Stephens and H. Waelbroeck, "Effective degrees of freedom in genetic algorithms and the block hypothesis," in *Proceedings of the Seventh International Conference on Genetic Algorithms (ICGA97)* (T. Bäck, ed.), (East Lansing), Morgan Kaufmann, 1997.

C. R. Stephens and H. Waelbroeck, "Schemata evolution and building blocks," *Evolutionary Computation*, vol. 7, no. 2, pp. 109–124, 1999.

P. A. Whigham. A schema theorem for context-free grammars. In *1995 IEEE Conference on Evolutionary Computation*, volume 1, pages 178–181, Perth, Australia, 29 Nov. - 1 Dec. 1995. IEEE Press.

P. A. Whigham. *Grammatical Bias for Evolutionary Learning.* PhD thesis, School of Computer Science, University College, University of New South Wales, Australian Defence Force Academy, October 1996.

P. A. Whigham. Search bias, language bias, and genetic programming. In J. R. Koza, D. E. Goldberg, D. B. Fogel, and R. L. Riolo, editors, *Genetic Programming 1996: Proceedings of the First Annual Conference*, pages 230–237, Stanford University, CA, USA, 28–31 July 1996. MIT Press.

D. Whitley, "A Genetic Algorithm Tutorial", *Statistics and Computing*, vol. 4, pages 65–85, 1994. (Also available as Technical Report CS-93-103, Department of Computer Science, Colorado State University, 1993.)