

## Bibliography

This is a very idiosyncratic of bibliography of some of the recent generalized linear model literature. See also [Books](#).

### New Response Distributions

Glm's assume a response distribution which is a linear exponential family plus a dispersion parameter. The following three references study the properties of this family form, and answer questions like "How many glm families are there?"

- Jørgensen, B. (1997). *The Theory of Dispersion Models*. Chapman and Hall, London.
- Smyth, G. K. (1996). Regression modelling of quantity data with exact zeroes. Proceedings of the Second Australia-Japan Workshop on *Stochastic Models in Engineering, Technology and Management*. Technology Management Centre, University of Queensland, 572-580. ([Postscript](#)).
- Jørgensen, B. (1992). *The theory of exponential dispersion models and analysis of deviance*. Monografias de Matemática No. 51, Instituto de Matemática pura e Aplicada, Rio de Janeiro.
- Jørgensen, B. (1987). Exponential dispersion models. *J. Roy. Statist. Soc. B*, **49**, 127-162.
- Brockwell, P. J., and Brown, B. M. (1978). Expansions for the positive stable laws. *Z. Wahrsch. Verw. Gebiete*, **45**, 213-224.
- Brockwell, P. J., and Brown, B. M. (1979). Estimation for the positive stable laws, I. *Austral. J. Statist.*, **21**, 139-148.
- Feller, W. (1971). *An Introduction to Probability Theory and Its Applications, Volume II, Second Edition*. Wiley, New York. Section XIII.6-7.
- Jørgensen, B. (1997), *The Theory of Dispersion Models*. Chapman and Hall, London. Section 4.2.1.
- Nolan, J. P. (1997). Numerical calculation of stable densities and distribution functions. *Communications in Statistics - Stochastic Models*, **13**, 759-774.

### Diagnostics and Residuals

- Breslow N. E. (1996). Generalized linear models: Checking assumptions and strengthening conclusions. *Statistica Applicata* **8**, 23-41. ([Postscript](#))
- Cook, R. D., and Weisberg, S. (1994). ARES plots for generalized linear models. *Computational Statistics and Data Analysis*, **17**, 303-315.
- Dunn, K. P., and Smyth, G. K. (1996). Randomized quantile residuals. *J. Comput. Graph. Statist.*, **5**, 236-244. ([Abstract](#) - [Postscript](#))
- Pierce, D. A., and Schafer, D. W. (1986). Residuals in generalized linear models. *Journal of the American Statistical Association*. **81**

### Robust Estimation

- Cantoni, E., and Ronchetti, E.(2001). "Resistant selection of the smoothing parameter for smoothing splines", *Statistics and Computing* **11**, 141-146.
- Cantoni, E., and Ronchetti, E. (2001). Robust inference for generalized linear models. *Journal of the American Statistical Association* **96**, 1022-1030.
- Cantoni, E. (2001). Robust inference based on quasi-likelihoods for generalized linear models and longitudinal data. *Proceedings of the International Conference on Robust Statistics 2001*.

## Generalized Nonlinear Models

- Hastie, T., and Tibshirani, R. (1997). Generalized Additive Models. *Encyclopedia of Statistical Science*, Wiley. ([Postscript](#))
- Czado, C. (1997). On Selecting Parametric Link Transformation Families in Generalized Linear Models. *Journal of Statistical Planning and Inference*. To appear. ([Postscript](#))
- Gay, D. M., and Welsh, R. E. (1988). Maximum likelihood and quasi-likelihood for nonlinear exponential family models. *Journal of the American Statistical Association*, **83**, 990-998.
- Rigby, R. and Stasinopoulos, M. (1992). Detecting break points in the Hazard Function in Survival Analysis. In *Statistical Modelling*, eds B. Francis, G.U.H. Seeber, P.G.M. van der Heyden and W. Jansen, pp 303-312. Elsevier Science Publishers B.V.
- Stasinopoulos, M. and Rigby, R. (1992). Detecting break points in Generalised Linear Models. *Computational Statistics and Data Analysis*, 13, 461-471.
- [Exponential Family Nonlinear Models](#), Bo-Cheng Wei (Southeast University, Nanjing), Springer-Verlag Singapore, 1998.

## Dispersion Modelling

- Rigby, R., and Stasinopoulos, M. (1998). [Mean and Dispersion Additive Models](#). Technical Report.
- Benjamin M. A., Rigby R. A. and Stasinopoulos M. D. (1998). [Modelling exponential family time series data](#). In *Statistical Modelling: Proceedings of the 13th International Workshop on Statistical Modelling*, eds B. Marx and H. Friedl. New Orleans.
- McCullagh, P., and Nelder, J. A. (1989). *Generalized Linear Models*, Second Edition. Chapman and Hall, London. (Chapter 10)
- Nelder, J. A., and Lee, Y. (1991). Generalized linear models for the analysis of Taguchi-type experiments. *Applied Stochastic Models and Data Analysis*, **7**, 107-120.
- Rigby, R. A. and Stasinopoulos, D. M. (1994). Robust fitting of an Additive model for the variance Heterogeneity. In *COMPSTAT Proceedings in Computational Statistics*, eds R. Dutter and W. Grossmann, pp 261-268, Physica-Verlag.
- Rigby R. A. and Stasinopoulos M. D. (1995). Mean and Dispersion Additive Models: Applications and Diagnostics. In *Statistical Modelling: Proceedings of the 10th International Workshop on Statistical Modelling*, eds G.U.H Seeber, B.J Francis, R Hatzinger, G. Steckel-Berger, Springer-Verlag.
- Rigby, R. A., and Stasinopoulos, D. M. (1996). Mean and Dispersion Additive Models. In *Statistical Theory and Computational Aspects of Smoothing* eds. W Hardle and M.G. Schimek, pp 215-230, Physica-Verlag.
- Rigby, R. A. and Stasinopoulos, D. M. (1996). A Semi-parametric Additive model for variance heterogeneity. *Statistics and Computing*, **6**, 57-65..
- Stasinopoulos, D. M. and Francis, B. (1993). Generalised Additive Models in GLIM4. *GLIM Newsletter*, **22**, pp 30-36.

- Smyth, G. K. (1989). Generalized linear models with varying dispersion. *Journal of the Royal Statistical Society B* **51**, 47-60. ([Abstract and Full Text](#))
- Smyth, G. K., and Verbyla, A. P. (1996). A conditional approach to residual maximum likelihood estimation in generalized linear models. *J. Roy. Statist. Soc. B*, **58**, 565-572. ([Abstract](#) - [Postscript](#)).
- Smyth, G. K., and Verbyla, A. P. (1999). Adjusted likelihood methods for modelling dispersion in generalized linear models. *Environmetrics*. To appear. ([Abstract](#) - [Zipped PostScript](#))
- Tran G., Stasinopoulos, D. M. (1995). Plotting additive fits in Generalised Additive Models. *GLIM Newsletter*, 24, pp 10-15.

## Overdispersion

- Albert, P. S. (1991). A two-state Markov model for a time series of epileptic seizure counts. *Biometrics* **47**, 1371-1381.
- Altham, P. M. E. (1976). Discrete variable analysis for individuals grouped into families. *Biometrika* **63**, 263-269.
- Altham, P. M. E. (1978). Two generalizations of the binomial distribution. *Journal of the Royal Statistical Society C* **27**, 162-167.
- Andersen, D. A. (1988). Some models for overdispersed binomial data. *Australian Journal of Statistics* **30**, 125-148.
- Barnwall, R. K., and Paul, S. R. (1988). Analysis of a one-way layout of count data with negative binomial variation. *Biometrika* **75**, 215-222.
- Bateman, G. I. (1950). The power of the  $\chi^2$  index of dispersion when Neyman's contagious distribution is the alternative hypothesis. *Biometrika* **37**, 59-63.
- Bennett, S. (1988). An extension of William's method of overdispersion models. *GLIM Newsletter* **17**, 12-18.
- Bissell, A. F. (1972). A negative binomial model with varying element sizes. *Biometrika* **59**, 435-441.
- Bohning, D. (1995). A review of reliable maximum likelihood algorithms for semiparametric mixture models. *Journal of Statistical Planning and Inference*, **47**, 5-28.
- Breslow, N. E. (1984). Extra-Poisson variation in log-linear models. *Journal of the Royal Statistical Society C* **33**, 38-44.
- Breslow, N. E. (1989). Score tests in overdispersed GLMs. In *Workshop on Statistical Modelling*, A. Decarli, B. J. Francis, R Gilchrist and G. U. H. Seeber, eds., Springer-Verlag, New York, pages 64-74.
- Breslow, N. E. (1990). Tests of hypotheses in overdispersed Poisson regression and other quasi-likelihood models. *Journal of the American Statistical Association* **85**, 565-571.
- Breslow, N. E. (1996). Generalized linear models: checking assumptions and strengthening conclusions. *Statistica Applicata*, **8**, 23-41.
- Breslow, N. E., and Clayton, D. G. (1993). Approximate inference in generalized linear mixed models. *Journal of the American Statistical Association*, **88**, 9-25.
- Breslow, N. E. and Lin, X. (1995). Bias correction in generalized linear models with a single component of dispersion. *Biometrika*, **82**, 81-91.
- Cameron, A. C., and Trivedi, P. K. (1990). Regression-based tests for overdispersion in the Poisson model. *Journal of Econometrics* **46**, 347-364.
- Davidian, M., and Carroll, R. J. (1987). Variance function estimation. *Journal of the American Statistical Association*, **82**, 1079-1081.
- Cox, D. R. (1983). Some remarks on overdispersion. *Biometrika* **70**, 269-274.
- Dean, C. B. (1991). Estimating equations for mixed Poisson models. In *Estimating Functions*, V. P.

Godambe, ed., Oxford University Press, Oxford, pages 35-46.

- Dean, C. B. (1992). Testing for overdispersion in Poisson and binomial regression models. *Journal of the American Statistical Association*, **87**, 451-457.
- Dean, C. B. (1998). Overdispersion. In: [Encyclopedia of Biostatistics](#), P. Armitage and T. Colton (eds.), Wiley, London, pages 3226-3232.
- Dean, C., and Lawless, J. F. (1989). Tests for detecting overdispersion in Poisson regression models. *Journal of the American Statistical Association*, **84**, 467-472.
- Diggle, P., Liang, K. Y., and Zeger, S. L. (1994). *Analysis of Longitudinal Data*. Oxford University Press, New York.
- Fisher, R. A. (1950). The significance of deviations from expectation in a Poisson series. *Biometrics*, **6**, 17-24.
- Godambe, V. P., and Thompson, M. E. (1989). An extension of quasi-likelihood estimation (with discussion). *Journal of Statistical Planning and Inference*, **22**, 137-152.
- Lesperance, M. L., and Kalbfleisch, J. D. (1992). An algorithm for computing the non-parametric MLE of a mixing distribution. *Journal of the American Statistical Association*, **87**, 120-126.
- Lindsay, B. (1995). *Mixture Models: Theory, Geometry and Applications*. NSF-CBMS Regional Conference Series in Probability and Statistics, Vol. 5, Institute of Mathematical Statistics, Hayward.
- Lindsey, J. K. (1993). *Models for Repeated Measurements*. Oxford University Press, New York. (Chapter 5)
- Lindsey, J. K. (1999). On the use of corrections for overdispersion. *Applied Statistics* **48**, 553-561. (Argues for use of mixture models and AIC rather than use of dispersion parameter without a probabilistic foundation.)
- McCullagh, P., and Nelder, J. A. (1989). *Generalized Linear Models*, Second Edition. Chapman and Hall, London. (Sections 4.5, 5.5, 6.2)
- O'Hara Hines, R. J., Lawless, J. F., and Carter, E. M. (1992). Diagnostics for a cumulative multinomial generalized linear model, with applications to grouped toxicological mortality data. *Journal of the American Statistical Association*, **87**, 1059-1069.
- Prentice, R. L. (1986). Binary regression using an extended beta-binomial distribution, with discussion of correlation induces by covariate measurement errors. *Journal of the American Statistical Association*, **81**, 321-327.
- Smith, P. J., and Heitjan, D. F. (1993). Testing and adjusting for departures from nominal dispersion in generalized linear models. *Applied Statistics*, **42**, 31-41.
- "Student" (1919). An explanation of deviations from Poisson's law in practice. *Biometrika*, **12**, 211-215.
- Tarone, R. E. (1979). Testing the goodness-of-fit of the binomial distribution. *Biometrika*, **66**, 585-590.
- Thall, P. F., and Vail, S. C. (1990). Some covariance models for longitudinal count data with overdispersion. *Biometrics*, **46**, 657-671.

## Random Effects

- Breslow, N. E., and Clayton, D. G. (1993). Approximate inference in generalized linear mixed models. *Journal of the American Statistical Association* **88**, 9-25.
- Firth, D., and Harris, I. R. (1991). Quasi-likelihood for multiplicative random effects. *Biometrika*, **78**, 545- 555.
- Gilks, W.R., Wang, C.C., Yvonnet, B. und Coursaget, P. (1993). Random-effects models for longitudinal data using Gibbs sampling. *Biometrics* **49**, 441-453.
- Gilmour, A. R., Anderson, R. D., and Rae, A. L. (1985). The analysis of binomial data by a generalized

linear mixed model. *Biometrika* **72**, 593-599.

- Ibrahim, J.G. and Kleinman, K.P. (1998). Semiparametric Bayesian methods for random effects models. *Practical Nonparametric and Semiparametric Bayesian Statistics*, 89-114, Lecture Notes in Statistics 133, Springer-Verlag, New York.
- Karim, M. R., and Zeger, S. L. (1992). Generalized linear models with random effects; salamander mating revisited. *Biometrics* **48**, 631-644.
- Kuk, A.Y.C. (1995). Asymptotically unbiased estimation in generalized linear models with random effects. *Journal of the Royal Statistical Society B*, **57**, 395-407.
- Lee, Y., and Nelder, J. A. (1996). Hierarchical generalized linear models (with discussion). *Journal of the Royal Statistical Society B*, **58**, 619-678.
- Ma, R. (1999). An Orthodox BLUP Approach to Generalized Linear Mixed Models. Ph.D. thesis, University of British Columbia.
- McCulloch, C. (1994). Maximum likelihood variance components estimation for binary data. *J. Amer. Statist. Assoc.* **89**, 330-335.  
[Probit with random effects. EM, REML, Gibbs sampling. Computations feasible for any number and structure of random effects and an arbitrary number of fixed effects.]
- McCulloch, C.E. (1997). Maximum likelihood algorithms for generalized linear mixed models. *Journal of the American Statistical Association* **92**, 162-170.
- McGilchrist, C. A. (1994). Estimation in generalized mixed models. *Journal of the Royal Statistical Society B* **56**, 61-69.
- Morton, R. (1987). A generalized linear model with nested strata of extra-Poisson variation. *Biometrics* **74**, 247-257.
- Piegorisch, W. W., and Casella, G. (1996). Empirical Bayes estimation for logistic regression and extended parametric regression models. *Journal of Agricultural, Biological, and Environmental Statistics* **1**, 231-249.
- Schall, R. (1991). Estimation in generalized linear models with random effects. *Biometrika*, **78**, 719-727.  
[Software](#)
- Stiratelli, R., Laird, N., and Ware, J. H. (1984). Random-effects models for serial observations with binary response. *Biometrics* **40**, 961-971.
- Wolfinger, R. and O'Connell, M. (1993). Generalized linear mixed models: a pseudo-likelihood approach. *Journal of Statistical Computation and Simulation* **48**, 233-243.
- Wolfinger, R.D. (1999). Fitting nonlinear mixed models with the new NLMIXED procedure. Paper 287, Proceedings of the 99 Joint Statistical Meetings.
- Wolfinger, R.D. (1999). Towards practical applications of generalized linear mixed models.
- Zeger, S. L. and Karim, M. R. (1991). Generalized linear models with random effects; a Gibbs sampling approach. *Journal of the American Statistical Association* **86**, 79-86.

## Bayesian

- Ranjini Natarajan and Robert E. Kass (1999). [Reference Bayesian methods for generalized linear mixed models](#). Technical Report 680, Department of Statistics, Carnegie-Mellon University.

## Time Series

- Albert, P. S. (1991). A two-state Markov model for a time series of epileptic seizure counts. *Biometrics* **47**, 1371-1381.

- Benjamin M. A., Rigby R. A. and Stasinopoulos M. D. (1998). [Modelling exponential family time series data](#). In *Statistical Modelling: Proceedings of the 13th International Workshop on Statistical Modelling*, eds B. Marx and H. Friedl. New Orleans.
- Liang, K. Y., and Zeger, S. L. (1986). Longitudinal data analysis using generalized linear models. *Biometrika*, **73**, 13-22.

## Multivariate

- Czado, C. (1997). Multivariate Probit Analysis of Binary Time Series with Missing Responses. ([Postscript](#))

## Industrial Applications

- Chipman, H., and Hamada, M. (1996). Bayesian analysis of ordered categorical data from industrial experiments. *Technometrics*, **38**, 1-10.
- Engel, J. (1992). Modelling variation in industrial experiments. *Appl. Statist.*, **41**, 579-593.
- Grego, J. (1993). Generalized linear models and process variation. *J. Quality Technology*, **25**, 288-295.
- Lee, Y., and Nelder, J. A. (1998). Generalized linear models for the analysis of quality-improvement experiments. *Canadian Journal of Statistics*, **26**, 95-105.
- Nair, V. N. (ed.) (1992). Taguchi's parameter design: a panel discussion. *Technometrics*, **34**, 127-204.
- Nair, V. N., and Pregibon, D. (1986). A data analysis strategy for quality engineering experiments. *AT&T Technical J.*, **65**, 73-84.
- Nair, V. N., and Pregibon, D. (1988). Analyzing dispersion effects from replicated factorial experiments.
- Nelder, J. A. (1994). A re-analysis of the pump-failure data. Comment on: "Conjugate likelihood distributions" [Scand. J. Statist. **20**, (1993), no. 2, 147-156] by E. I. George, U. E. Makov and A. F. M. Smith. With a reply by George, Makov and Smith. *Scand. J. Statist.*, **21**, 187-191.
- Nielsen, L.K., Smyth, G.K., and Greenfield, P.F. (1991). Hemacytometer cell count distributions: implications of non-Poisson behaviour. *Biotechnology Progress*, **7**, 560-563.
- Smyth, G. K. (1996). Regression analysis of quantity data with exact zeros. *Proceedings of the 2nd Australia-Japan Workshop on Stochastic Models in Engineering, Technology and Management*, R. J. Wilson, D. N. P. Murthy and S. Osaki (eds.), Technology Management Centre, University of Queensland, pp. 572-580.
- Vining, G. G., and Myers, R. H. (1990). Combining Taguchi and response surface methodologies: a dual response approach. *J. Quality Technology*, **22**, 38-45.

## Biological Applications

- Hardy I. C. W., and Field S. A. (1998). Logistic analysis of animal contests. *Animal Behaviour* **56**, 787-792.

## Insurance Applications

- Smyth, G. K., and Jørgensen, B. (2002). Fitting Tweedie's compound Poisson model to insurance claims data: dispersion modelling. *ASTIN Bulletin* **32**, 143-157. ([PDF](#)) 6/2002
- McCullagh, P., and Nelder, J. A. (1983). *Generalized Linear Models*. Chapman and Hall, London. [Models claim size using gamma regression with reciprocal link.]
- McCullagh, P., and Nelder, J. A. (1989). *Generalized Linear Models*. Second Edition. Chapman and

Hall, London.

[Car insurance claims are treated in Section 8.4.1. A power variance function is estimated for this data data using extended quasi-likelihood in Section 12.6.2.]

- Taylor, G. C. (1989). Use of spline functions for premium rating by geographic area. *ASTIN Bulletin* **19**, 91-122.

[Uses gamma responses and bivariate regression splines as covariates.]

- Haberman, S., and Renshaw, A. E. (1990). Generalized linear models and excess mortality from peptic ulcers. *Insurance: Mathematics and Economics* **9**, 147-154.
- Mack, T. (1991). A simple parametric model for rating automobile insurance or estimating IBNR claims reserves. *ASTIN Bulletin* **22**, 93.

[Models claim size using gamma regression with log-link.]

- Renshaw, A. E. (1991). Actuarial graduation practice and generalized linear and non-linear models. *Journal of the Institute of Actuaries* **119**, 295-312.
- Brockman, M. J., and Wright, T. S. (1992). Statistical model rating: making effective use of your data. *Journal of the Institute of Actuaries* **119**, 457.

[Models claim size using gamma regression with log-link.]

- Renshaw, A. E. (1993). An application of exponential dispersion models in premium rating. *ASTIN Bulletin* **23**, 145-147.

[Suggests use of compound Poisson responses using GLIM.]

- Renshaw, A. E. (1994). Modelling the claims process in the presence of covariates. *ASTIN Bulletin* **24**, 265-286.

[An overview of GLMs for modelling insurance claims including Poisson regression for claims frequency, gamma regression for claim size and compound Poisson for aggregate claim value.]

- Nelder, J. A., and Verrall, R. J. (1997). Credibility theory and generalized linear models. *ASTIN Bulletin* **27**, 71-82.

[Credibility estimates are obtained by including random effects in a generalized linear model. Proposes to do this using extended quasi-likelihood.]

- Rolski, T., Schmidli, H., Schmidt, V., and Teugels, J. (1999). *Stochastic Processes for Insurance and Finance*. John Wiley & Sons, Chichester.

[Lots of material on distributions but no explicit coverage of generalized linear models.]

- Haberman, S., and Renshaw, A. E. (1996). Generalized linear models and actuarial science. *The Statistician* **45**, 407-436.

[Nice review article including all of the above applications.]

- Haberman, S., and Renshaw, A. E. (1998). Actuarial applications of generalized linear models. In *Statistics in Finance*, D. J. Hand and S. D. Jacka (eds), Arnold, London.

[Similar to Haberman and Renshaw (1996).]

- Holler, K. D., Sommer, D., and Trahair, G. (1999). Something old, something new in classification ratemaking with a novel use of GLMs for credit insurance. *Casualty Actuarial Forum*, Winter 1999.
- Millenhall, S. J. (1999). A systematic relationship between minimum bias and generalized linear models. [1999 Proceedings of the Casualty Actuarial Society](#) **86**, 393-487.

[Very nice review of using generalized linear models to set premium rates with particular reference to minimum bias models. Discusses Tweedie models with power variance functions in Sections 8.3 and 8.4]

- Murphy, K. P., Brockman, M. J., and Lee, P. K. W. (2000). Using generalized linear models to build dynamic pricing systems. *Casualty Actuarial Forum*, Winter 2000.

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