

Curriculum Vitae

R. DARRELL BOCK

January 26, 2010

Date and Place of Birth: September 17, 1927
 Oakdale, Pennsylvania

Education: B.S. Carnegie Institute of Technology, 1948
 M.A. University of Chicago, 1950
 Ph.D. University of Chicago, 1952

HONORS

Eagle Scout, 1942; Silver Palm, 1943
Faville-Ellerton Social Studies Award, Carnegie Institute of Technology, 1948
Susan Culver Rosenberg Dissertation Prize, University of Chicago, 1952
President, Psychometric Society, 1972–73
Fellow, Center for Advanced Study in the Behavioral Sciences, 1978–79
Fellow, American Statistical Association
Fellow, Royal Statistical Society
National Council on Measurement in Education award for “Contributions to the design and analysis of educational assessment,” 1990
Educational Testing Service award for “Distinguished contributions to educational measurement,” 1991
American Psychological Association Division 5 award for “Distinguished lifetime contributions to evaluation, measurement, and statistics, 1997
American Educational Research Association Linquist Award for distinguished contributions to educational measurement, 1999.

EMPLOYMENT

Adjunct Professor, Center for Health Statistics,
University of Illinois in Chicago, 2005—
Study Director, National Opinion Research Center,
University of Chicago, 1995–1999
Professor Emeritus Department of Psychology,
University of Chicago, 1994—
Chairman, Committee on Research Methodology and Quantitative

Psychology, Department of Psychology, University of Chicago, 1984–1993
Visiting Fellow, Institute of Education, University of London, 1988–1997
Visiting Professor, Centre for Applied Statistics, Lancaster University, 1980
summer term
Professor, Departments of Psychology and of Education,
University of Chicago 1964–1993
Associate Professor, Department of Psychology, University of North Carolina
1961–64
Assistant Professor, Department of Psychology, University of North Carolina,
1958–61
Research Associate [Assistant Professor], Department of Psychology,
University of Chicago, 1955–58
Military Service, 1953–54; Assignment: Psychology Assistant,
Personnel Research and Procedures Division, TAGO

PROFESSIONAL AFFILIATIONS

American Educational Research Association
National Council on Measurement in Education
Behavioral Genetics Association
Biometric Society
Psychometric Society
American Statistical Association
Royal Statistical Society
Society for the Study of Human Biology

SELECTED PUBLICATIONS

BOOKS

- Bock, R. D. (1957). *Methods and applications of optimal scaling*. Chapel Hill, NC: Psychometric Laboratory, University of North Carolina.
- Bock, R. D., & Jones, L. V. (1968). *The measurement and prediction of judgment and choice*. San Francisco: Holden-Day.
- Bock, R. D. & Repp, B. H. (1974). *MATCAL: Double Precision Matrix Operations Subroutines for the IBM System/360-370 Computers*. Ann Arbor, MI: National Educational Resources.
- Bock, R. D. (1975). *Multivariate statistical methods in behavioral research*. New York: McGraw-Hill. (1985 reprint, Scientific Software Int'l, Chicago.)
- Bock, R. D., & Moore, E. G. J. (1986). *Advantage and disadvantage: Profile of American youth*. Hillsdale, NJ: Erlbaum.
- Bock, R. D. (Editor) (1989). *Multilevel analysis of educational data*. New York: Academic Press.

ARTICLES

- Bock, R. D. (1950). An adaptation of Holzinger's B-coefficient for the analysis of sociometric data. *Sociometry*, **12**, 146–153.
- Bock, R. D. & Husain, S. Z. (1952). Factors of the tele: a preliminary report. *Sociometry*, **15**, 206–219.
- Bock, R. D. (1956). The selection of judges for preference testing. *Psychometrika*, **21**, 349–366.
- Bock, R. D. (1956). A generalization of the law of comparative judgment applied to a problem in the prediction of choice. *American Psychologist*, **11**, 442 (Abstract).
- Bock, R. D. (1957). Note on the least-squares solution for the method of successive categories. *Psychometrika*, **22**, 231–240.
- Bock, R. D. (1958). Remarks on the test of significance for the method of paired comparisons. *Psychometrika*, **23**, 323–334.
- Chapman, L. J., & Bock, R. D. (1958). Components of variance due to acquiescence and content in the F-scale measure of authoritarianism. *Psychological Bulletin*, **55**, 328–333.
- Bock, R. D. (1960). Components of variance analysis as a structural and discriminant analysis for psychological tests. *British Journal of Statistical Psychology*, **13**, 151–163.

- Jones, L. V. & Bock, R. D. (1960). Multiple discriminant analysis applied to “Ways to Live” ratings from six cultural groups. *Sociometry*, **23**, 162–176.
- Shuford, E. H., Jones, L. V., & Bock, R. D. (1960). A rational origin obtained by the method of contingent paired comparisons. *Psychometrika*, **25**, 343–356.
- Bock, R. D. (1963). Programming univariate and multivariate analysis of variance. *Technometrics*, **5**, 95–117.
- Bock, R. D. (1963). Multivariate analysis of variance of repeated measurements. In C. W. Harris (Ed.), *Problems in measuring change*, Madison: University of Wisconsin Press, 85–103
- Bock, R. D. (1964). A computer program for univariate and multivariate analysis of variance. In *Proceedings of scientific computing symposium on statistics*. Yorktown Heights, NY: Thomas J. Watson Research Center, 69–111.
- Bock, R. D. (1966). Contributions of multivariate statistical methods to educational psychology. In R. B. Cattell (Ed.), *Handbook of multivariate experimental psychology*. Chicago: Rand-McNally, 820–840.
- Bock, R. D., & Bargmann, R. E. (1966). Analysis of covariance structures. *Psychometrika*, **31**, 507–533.
- Wiley, D. E., & Bock, R. D. (1967). Quasi-experimentation in educational settings: Comment. *School review*, **75**, 363–366.
- Bock, R. D., & Haggard E. A. (1968). The use of multivariate analysis of variance in behavioral research. In D. Whitla (Ed.), *Handbook of measurement and assessment in behavioral sciences*. Boston: Addison-Wesley, 100–142.
- Bock, R. D., & Vandenberg, S. G. (1968). Components of heritable variation in mental test scores. In S. G. Vandenberg (Ed.), *Progress in human behavior genetics*. Baltimore: Johns Hopkins University Press, 233–260.
- Bock, R. D. (1969). Estimating multinomial response relations. In R. C. Bose et al. (Eds.), *Essays in probability and statistics*, Chapel Hill: University of North Carolina Press, 111–132.
- Bock, R. D., Dicken, C., & Van Pelt, J. (1969). Methodological implications of content-acquiescence correlation in the MMPI. *Psychological Bulletin*, **71**, 127–139.
- Bock, R. D., & Lieberman, M. (1970). Fitting a response model for n dichotomously scored items. *Psychometrika*, **35**, 179–197.
- Bock, R. D., Vandenberg, S. G., Brable, W., & Pearson, W. (1971). A behavioral correlate of blood-group discordance in dizygotic twins. *Behavior Genetics*, **1**, 89–98.

- Bock, R. D., & Wood, R. (1971). Test theory. *Annual Review of Psychology*, **22**, 193–224.
- Bock, R. D. (1972). Review of L. J. Cronbach, G. C. Gleser, H. Nanda, & N. Rajaratnam, *The dependability of behavioral measurements*. *Science*, **178**, 1275–1275A.
- Bock, R. D. (1972). Estimating item parameters and latent ability when responses are scored in two or more nominal categories. *Psychometrika*, **37**, 29–51.
- Bock, R. D. (1973). Word and image: sources of the verbal and spatial factors in mental test scores. *Psychometrika*, **38**, 437–457.
- Bock, R. D., & Kolakowski, D. (1973). Further evidence of sex-linked major-gene influence on human spatial visualizing ability. *American Journal of Human Genetics*, **25**, 1–14.
- Bock, R. D., Wainer, H., Peterson, A., Thissen, D., Murray, J., & Roche, A. (1973). A parameterization for individual human growth curves. *Human Biology*, **45**, 63–80.
- Bock, R. D., & Petersen, A. C. (1975). A multivariate correction for attenuation. *Biometrika*, **62**, 673–678.
- Bock, R. D. (1976). Basic issues in the measurement of change. In D. N. M. de Gruijter & L. J. T. van der Kamp (Eds.), *Advances in Psychological and Educational Measurement*. London: Wiley & Sons, 75–76.
- Bock, R. D., & Thrash, W. (1977). Characterizing a latent trait distribution. In P. R. Krishnaiah (Ed.), *Applications of statistics*, Amsterdam: North Holland Publishing Co, 89–96.

- Bock, R. D. (1978). A psychometric study at Barrow Day School. In P. L. Jamison, S. L. Zegura, & F. A. Milan (Eds.), *Eskimos of Northwestern Alaska*. Stroudsburg, PA: Dowden, Hutchinson, & Ross, 237–261.
- Bock, R. D., & Thissen, D. (1978). Familial resemblance in patterns of growth in stature. *Twin studies: Proceedings of the Second International Congress on Twin Studies*. New York: Alan R. Liss, Inc.
- Bock, R. D. (1979). Univariate and multivariate analysis of variance of time-structured data. In J. R. Nesselrode & P. B. Baltes (Eds.), *Longitudinal research in human development: design and analysis*, New York: Academic Press, 199–231.
- Bock, R. D., & Perline R. (1979). A lod-score method for detecting linkage on the X-chromosome between a marker locus and a major gene locus for a quantitative trait. *Behavioral Genetics*, **9**, 139–149.
- Bock, R. D. (1980). Quantitative genetic analysis of variations in adult stature: the contribution of path analysis. In F. E. Johnston, A. F. Roche, & C. Susanne (Eds.), *Human Physical Growth and Maturation: methodologies and Factors*. New York: Plenum, 119–135.
- Bock, R. D., & Thissen, D. (1980). Statistical problems of fitting individual growth curves. In F. E. Johnston, A. F. Roche, & C. Susanne (Eds.), *Human physical growth and maturation: methodologies and factors*. New York: Plenum, 265–290.
- Bock, R. D., & Aitkin, M. (1981). Marginal maximum likelihood estimation of item parameters: application of an EM algorithm. *Psychometrika*, **46**, 443–445.
- Bock, R. D., & Mislevy, R. J. (1981). An item response model for matrix-sampling data: the California Grade Three Assessment. In D. Carlson (Ed.), *Testing in the states: beyond accountability*. San Francisco: Jossey-Bass, 65–90.
- Bock, R. D., & Mislevy, R. J. (1982). Adaptive EAP estimation of ability in a microcomputer environment. *Applied Psychological Measurement*, **6**, 431–444.
- Bock, R. D., Mislevy, R. J., & Woodson, C. E. (1982). The next stage in educational assessment. *Educational Researcher*, **11**, 4–11, 16.
- Kolakowski, D. & Bock, R. D. (1982). A multivariate generalization of probit analysis. *Biometrics*, **37**, 541–551.
- Mislevy, R. J., & Bock, R. D. (1982). Biweight estimates of latent ability. *Journal of Educational and Psychological Measurement*, **42**, 725–737.
- Bock, R. D. (1983). Within-subject experimentation in psychiatric research. In R. D. Gibbons & Dysken (Eds.), *Statistical and methodological advances in psychiatric research*. New York: SP Medical & Scientific Books, 59–90.

- Bock, R. D. (1983). The mental growth curve re-examined. In D. Weiss (Ed.), *New horizons in testing*, New York: Academic Press, 205–219.
- Bock, R. D. (1983). The discrete Bayesian. In H. Wainer & S. Messick (Eds.), *Principals of psychometrics*. Hillsdale, NJ: Erlbaum, 103–115.
- Wilson, M., & Bock, R. D. (1985). Spellability: a linearly ordered content domain. *American Educational Research Journal*, **22**, 297–307.
- Bock, R. D. (1986). Unusual growth patterns in the Fels data. In A. Demirjian (Ed.), *Human growth: a multidisciplinary review*. London: Taylor & Francis, 69–84.
- Gibbons, R. D., & Bock, R. D. (1987). Trend in correlated proportions. *Psychometrika*, **52**, 113–124.
- Bock, R. D., Gibbons, R. D., & Muraki, E. (1988). Full information item factor analysis. *Applied Psychological Measurement*, **12**, (3), 261–280.
- Bock, R. D., & Mislevy, R. J. (1988). Comprehensive educational assessment for the states: the duplex design. *Educational Evaluation and Policy Analysis*, **10**, (2), 89–105.
- Bock, R. D., Muraki, E., & Pfiffenberger, W. (1988) Item pool maintenance in the presence of item parameter drift. *Journal of Educational Measurement*, **25**, 275–285.
- Bock, R. D. (1989). Addendum—measurement of human variation: a two-stage model. In R. D. Bock (Ed.), *Multilevel analysis of educational data*, New York: Academic Press, 319–342.
- Bock, R. D., & Mislevy, R. J. (1989). Lernerfolgsmessungen für die Staaten: Das Duplexdesign. In K. Ingenkamp & W. H. Schreiber (Eds.) *Was wissen unsere Schüler?* Weinheim: Deutscher Studien Verlag, 355–290.
- Bock, R. D. & Sykes, R. C. (1989). Evidence for continuing secular increase in height within families in the United States. *American Journal of Human Biology*. **18**, 413–426.
- Bock, R. D. (1991). Prediction of Growth. In L. M. Collins & J. L. Horne (Eds.), *Best methods for the analysis of change: recent advances, unanswered questions, future directions*. Washington, D.C.: American Psychological Association, 126–136.
- Chandler, P., & Bock, R. D. (1992). Age changes in adult stature: trend estimation from mixed longitudinal data. *Annals of Human Biology*, **18**, 433–440.
- Bock, R. D. (1994). Structural and nonstructural analysis of multiphasic growth. Appendix to R. D. Bock, S. H. C. du Toit & D. Thissen, *AUXAL: Auxological*

- Analysis of Longitudinal Measurements of Human Stature*. Chicago: Scientific Software Int'l.
- Bock, R. D. (1995). Growth models. In R. Hauspie, G. Lindgren, & F. Falkner (Eds.). *Essays on auxology*. Welwyn Garden City (Herts.): Castlemead, 28–38.
- Bock, R. D. (1995). Open-ended exercises in large-scale educational assessment. In L. B. Resnick and J. G. Wirt (Eds.) *Linking school and work: Roles for standards and assessment*. San Francisco: Jossey-Bass, pp. 305–338.
- Bock, R. D. & Gibbons, R. D. (1996). High-dimensional multivariate probit analysis. *Biometrics*, **52**, 1183–1194.
- Bock, R. D. (1997). The Nominal Categories Model. In W. J. van der Linden & R. K. Hambleton (Eds.), *Handbook of Modern Item Response Theory*. New York: Springer Verlag, 33–49.
- Bock, R. D., & Zimowski, M. F. (1997). Multiple Group IRT. In W. J. van der Linden & R. K. Hambleton (Eds.), *Handbook of Modern Item Response Theory*. New York: Springer Verlag, 433–448.
- Bock, R. D., Thissen, D. & Zimowski, M. F. (1997). IRT estimation of domain scores. *Journal of Educational Measurement*, **34**, 197–211.
- Bock, R. D. (1997). A brief history of item response theory. *Educational Measurement: Issues and Practice*, **15**, 21–33.
- Bock, R. D. & Schilling, S. (1997). High-dimensional full-information item factor analysis. In M. Berkane (Ed.), *Latent Variable Modeling and Applications to Causality*. New York: Springer-Verlag.
- Bock, R. D. & Zimowski, M. F. (1998). *Feasibility Studies of Two-stage Testing in Large-scale Educational Assessment: Implications for NAEP*. Palo Alto CA: American Institutes for Research.
- Leonelli, B. T., Chang, C-H., Bock, R. D. & Schilling, S. G. (2000). Interpretation of a full-information item-level factor analysis of the MMPI-2: Normative sampling and non-pathognomonic descriptors. *Journal of Personality Assessment*. **74**,400-422.
- Bock, R. D., Brennan, R. L. & Muraki, E. (2002). The information in multiple ratings. *Applied Psychological Measurement*. **26**, 364–375.
- Bock, R. D. (2004). Multiple prepubertal growth spurts in children of the Fels Longitudinal Study: comparison with results from the Edinburgh Growth Study. *Annals of Human Biology*. **31**, 59–74.
- Schilling, S. G. & Bock, R. D. (2005). High-dimensional maximum marginal like-

- likelihood item factor analysis by adaptive numerical Integration. *Psychometrika* **70**, 533–555.
- Bock, R. D. & Böckenholt, U. (2004). Measurement with the Nominal Categories Model. *Encyclopedia of Social Measurement*. San Diego: Academic Press.
- Bock, R. D. & du Toit, S. H. C. (2004) Parameter estimation in the context of longitudinal growth modes. In R. C. Hauspie, N., Cameron, N. & L. Molinari (Eds.) *Methods in Human Growth Research*. Cambridge: Cambridge University Press.
- Bock, R. D. & Moustaki, I. (2007). Item response theory in a general framework. In C. R. Rao & S. Sinharay, (Eds.), *Handbook of Statistics*, Vol. 25. Amsterdam: Elsevier, 469-513.
- Bock, R. D. & Gibbons, R. D. (in press). Factor analysis of Categorical Item Responses. In M. Nering & R. Ostini (Eds.) *Handbook of Item Response Theory Models*. Philadelphia: Taylor & Francis.

COMPUTER PROGRAMS

- Mislevy, R. J., & Bock, R. D. (1983). *BLOG: maximum likelihood item analysis and test scoring—logistic models*. Chicago: Scientific Software Int'l.
- Finn, J. & Bock, R. D. (1988). *MULTIVRIANCE: Univariate and multivariate analysis of variance, covariance, and regression* (Version 7.3). Chicago: Scientific Software Int'l.
- Bock, R. D., du Toit, S. H. C. & Thissen, D. (1994). *AUXAL: Auxological Analysis of Longitudinal Measurements of Human Stature*. Chicago: Scientific Software Int'l.
- Zimowski, M. F., Muraki, E., Mislevy, R. J., & Bock, R. D. (1995) *BLOG-MG: multiple-group item analysis and test scoring*. Chicago: Scientific Software Int'l.
- Muraki, E. & Bock, R. D. (1996). *PARSCALE: IRT analysis and scoring of rating scale data* (Version 3.0). Chicago: Scientific Software Int'l.

STUDENTS AND DISSERTATION TOPICS

Donald C. Ross (1960)

“The classification of aphasics”

James J. McKeon (1961)

“Measurement procedures based on comparative judgment”

Bishwa Nath Mukerjee (1963)

“Derivation of likelihood ratio tests for Guttman quasi-simplex covariance structures”

Douglas K. Spiegel (1965)

“Relations between to test batteries”

Shizuhiko Nishisato (1965)

“Minimum entropy clustering of test items”

Stephen J. Zyzanski (1968)

“A multivariate normal analysis for qualitative data”

Vivian C. Wolf (1969)

“A study of the embedded figures test in relation to sex differences in the primary mental abilities”

Marcus Lieberman (1970)

“Estimation of moral judgment level using items whose alternatives form a graded scale”

Donald Kolakowski (1970)

“A behavior-genetic analysis of spatial ability using latent trait estimation”

Robert Wood (1970)

“Computerized adaptive sequential testing”

William F. Fitzgerald (1971)

“The effect of modality proficiency on single- versus multiple-channel learning”

Anne C. Petersen (1973)

“The relationship of androgenicity in males and females to spatial ability and fluent production”

Michael I. Waller (1973)

“Removing effects of random guessing from latent trait ability estimates”

David M. Thissen (1976)

“Incorporating item response latencies in latent trait estimation”

Mark R. Reiser (1980)

“A latent trait model for group effects”

- Robert D. Gibbons (1981)
“The analysis of discrete time-structured data”
- Eiji Muraki (1983)
“Marginal maximum likelihood estimation for three-parameter polychotomous item response models: application of an EM algorithm”
- Michele F. Zimowski (1985)
“Attributes of spatial test items that influence cognitive functioning”
- Ulf Böckenholt (1985)
“Inverse prediction in behavioral research”
- Robert C. Sykes (1985)
“Secular changes in highly heritable traits: IQ and stature”
- Donald R. Hedeker (1989) “Random Regression models with autocorrelated errors: investigating drug plasma levels and clinical response”
- Steven G. Schilling (1993)
“Advances in full-information factor analysis using the Gibbs sampler”
- Peggy J. Chandler (1993)
“Analysis of decline after middle age in relation to physical activity”
- Eisuke Segawa (1998)
“Application of hierarchical nonlinear models to children’s growth in vocabulary and height”