

Steven K. Thompson

Present Position: Professor, Department of Statistics, Pennsylvania State University. Address: Department of Statistics, 314 Thomas Building, Pennsylvania State University, University Park, PA 16802-2111, Phone: (814) 865-3235, Facsimile: (814) 863-7114, Email: skt@stat.psu.edu.

Previous Positions:

Associate Professor, Department of Statistics, Pennsylvania State University, University Park, PA, 1993-2002.

Lecturer, Department of Mathematics and Statistics, The University of Auckland, New Zealand, 1990-1992.

Assistant Professor, Department of Mathematical Sciences, University of Alaska, Fairbanks, 1984-1990.

Biometrician, Research Division, Alaska Department of Fish and Game, Kodiak, Alaska, 1979-1984.

Sabbaticals at The University of Copenhagen, Denmark, 1988-1989; University of Groningen, The Netherlands, and Stanford University 1999-2001.

Education:

A.B. 1970, Mathematics, University of California, Berkeley.

Ph.D. 1982, M.S. 1976, Statistics, Oregon State University.

PUBLICATIONS

Books:

Thompson, S.K. (2002). *Sampling, Second Edition*. New York: Wiley. (Wiley Series in Probability and Mathematical Statistics). First edition published in 1992.

Thompson, S.K., and Seber, G.A.F. (1996). *Adaptive Sampling*. New York: Wiley. (Wiley Series in Probability and Mathematical Statistics).

Journal papers, chapters in books, and other articles:

Dryver, A.L., and Thompson, S.K. (2003). Improved unbiased estimators in adaptive cluster sampling. In review.

Felix-Medina, M. H., and Thompson, S.K. (2003). Adaptive cluster double sampling. In review.

- Chow, M. and Thompson, S.K. (2003). Estimation with link-tracing sampling designs—a Bayesian approach. In review.
- Thompson, S.K. (2003). Markov-chain sampling designs in graphs. Technical Report 03-01, Department of Statistics, Pennsylvania State University, University Park.
- Felix-Medina, M.H. and Thompson, S.K. (2003). Combining link-tracing sampling and cluster sampling to estimate the size of hidden populations. *Journal of Official Statistics*, to appear.
- Thompson, S.K. and Collins, L.M. (2001). Adaptive sampling in research on risk-related behaviors. *Drug and Alcohol Dependence* **68** S57-S67.
- Thompson, S.K. (2002). On sampling and experiments. *Environmetrics* **13** 429-436.
- Chao, T-C., and Thompson, S.K. (2001). Optimal adaptive selection of sampling sites. *Environmetrics* **12** 517-538.
- Thompson, S., and Frank, O. (2000). Model-based estimation with link-tracing sampling designs. *Survey Methodology* **26** 87-98.
- National Research Council (2000). *Improving the Collection, Management, and Use of Marine Fisheries Data*. Washington, D.C.: National Academies Press. Co-author as member of NRC Committee on Improving the Collection and Use of Fisheries Data.
- Chow, M. and Thompson, S. K. (1999). A Bayesian Approach to Estimation With Link-tracing Sampling Designs. *ASA Proceedings of the Section on Survey Research Methods*. Alexandria, VA: American Statistical Association, 611–616.
- Chao, C. T., and Thompson, S. K. (1999). Incomplete Adaptive Cluster Sampling Design. *ASA Proceedings of the Section on Survey Research Methods*. Alexandria, VA: American Statistical Association, 345–350.
- Felix-Medina, M. H. and Thompson, S. K. (1999). Adaptive Cluster Double Sampling. *ASA Proceedings of the Section on Survey Research Methods*. Alexandria, VA: American Statistical Association, 339–344.
- Thompson, S.K. (1998). Estimation, Model-Unbiased. In Kotz, S. Read, C.B., and Banks, D.L., eds., *Encyclopedia of Statistical Sciences, Vol. 2*. New York: Wiley. 220-222.
- Dryver, A. L. and Thompson, S. K. (1998). Improving Unbiased Estimators in Adaptive Cluster Sampling. *ASA Proceedings of the Section on Survey Research Methods*. Alexandria, VA: American Statistical Association, 727–731.
- Chao, C. T. and Thompson, S. K. (1998). Adaptive Optimal Selection of

- Sampling Locations. *ASA Proceedings of the Section on Survey Research Methods*. Alexandria, VA: American Statistical Association, 425–430.
- Thompson, S. K. (1998). Adaptive Sampling in Graphs. *ASA Proceedings of the Section on Survey Research Methods*. Alexandria, VA: American Statistical Association, 13–22.
- Mosquin, P. L. and Thompson, S. K. (1998). Frame Free Adaptive Designs. *ASA Proceedings of the Section on Survey Research Methods*. Alexandria, VA: American Statistical Association, 431–436.
- Dryver, A.L., and Thompson, S.K. (1998). Adaptive cluster sampling without replacement of clusters. Technical Report 98-07, Department of Statistics, Pennsylvania State University.
- Thompson, S.K. (1997). Design and inference in adaptive sampling. *Statistical Society of Canada Proceedings of the Survey Methods Section*. Montreal: Statistical Society of Canada (McGill University), 1–5.
- Thompson, S.K. (1997). Spatial sampling (with discussion). In Goode, J., ed., *Precision Agriculture: Spatial and Temporal Variability of Environmental Quality*. Wiley. (Ciba Foundation Symposium 210) 161-172.
- Thompson, S.K. (1997). Adaptive sampling in behavioral surveys. In Harrison, L., and Hughes, A. eds., *The Validity of Self-Reported Drug Use: Improving the Accuracy of Survey Estimates*. NIDA Research Monograph 167. Rockville, MD: National Institute of Drug Abuse, 296-319.
- Thompson, S.K. (1997). Effective sampling strategies for spatial studies. *Metron* **55** 1-21.
- Thompson, S.K. (1996). Adaptive cluster sampling based on order statistics. *Environmetrics* **7** 123-133.
- Thompson, S.K. (1995). Adaptive sampling. *The Survey Statistician*, **32** 13-15.
- Thompson, S. K. (1995). Adaptive Sampling in Environmental Studies. *Computing Science and Statistics: Statistics and Manufacturing with Subthemes in Environmental Statistics, Graphics and Imaging; Proceedings of the 27th Symposium on the Interface*. Fairfax Station, VA: Interface Foundation of North America, 90–92.
- Thompson, S.K. and Seber, G.A.F. (1994). Detectability in conventional and adaptive sampling. *Biometrics* **50** 712-724.
- Thompson, S.K. (1994). Book review of *Distance Sampling*, Buckland et al., *Biometrics* **50** 891-892.

- Thompson, S.K. (1993). Multivariate aspects of adaptive cluster sampling. In *Multivariate Environmental Statistics*, G.P. Patil and C.R. Rao, eds., p. 561-572. New York: North Holland/Elsevier Science Publishers.
- Seber, G.A.F. and Thompson, S.K. (1993). Environmental adaptive sampling. In *Handbook of Statistics*, Vol. 12 (Environmental Statistics), G.P. Patil and C.R. Rao, eds., p. 201-220. New York: North Holland/Elsevier Science Publishers.
- Thompson, S.K., Ramsey, F.L., and Seber, G.A.F. (1992). An adaptive procedure for sampling animal populations. *Biometrics* **48** 1195–1199.
- Thompson, S.K. (1991). Adaptive cluster sampling: Designs with primary and secondary units. *Biometrics* **47** 1103-1115.
- Thompson, S.K. (1991). Stratified adaptive cluster sampling. *Biometrika* **78** 389-397.
- Thompson, S.K. (1990). Adaptive cluster sampling. *Journal of the American Statistical Association* **85** 1050-1059.
- Thompson, S.K. (1987). Adaptive sampling. *ASA Proceedings of the Section on Survey Research Methods*. Alexandria, VA: American Statistical Association, 784-786.
- Thompson, S.K. (1987). Sample size for estimating multinomial proportions. *The American Statistician* **41** 42-46.
- Thompson, S.K., and Ramsey, F.L. (1987). Detectability functions in observing spatial point processes. *Biometrics* **43** 355–362.
- Thompson, S.K. (1985). Book review of *Multivariate Methods in Ecological Work*. *Journal of the American Statistical Association* **83** 784-786.
- Lindzey, F. G., Thompson, S.K., and Hodges, J.I. (1977). Scent station index of black bear abundance. *Journal of Wildlife Management* **41** 151-153.

Awards and Service

- Fellow of The American Statistical Association, elected 2001: “For outstanding contributions to the theory of statistical sampling and to the development of sampling methodology particularly suited to rare and elusive populations.”
- Wiley Author Award 2001, Excellence in Writing. Award chosen by Wiley Statistics Board for most influential titles of past decade.
- Scientific Advisory Panel Member for EPA Star Grant Programs in Environmental Statistics: Space-Time Aquatic Resources Modeling and Analysis (Department of Statistics, Colorado State University); and

Design-Based/ Model-Assisted Survey Methodology for Aquatic Resources (Department of Statistics, Oregon State University), 2001-2003.

Scientific Advisory Panel member, National Institutes of Health, National Institute on Drug Abuse, on the Office of National Drug Control Policy Media Campaign Evaluation, 2002.

Advisory Working Group member, Centers for Disease Control, Working Meeting on National Program for HIV/AIDS Behavioral Surveillance, Atlanta, Georgia, 2002.

Panel member for National Research Council, Committee on Improving the Collection and Use of Fisheries Data, 1998-2000.

International Scientific Panel member for Workshop on The Assessment and Management of Benthic Resources, sponsored by the Fund for Research in Fisheries (IFOP) and the Ministry of Fisheries, Valparaiso, Chile, August 30-September 6, 1999.

Scientific Advisory Panel member, National Institutes of Health, National Institute on Drug Abuse, on evaluation of substance abuse prevention policy, 1998.

Review Panel member for National Science Foundation for NSF/EPA Water and Watersheds Initiative, 1996 and 1997.

Review Panel member for National Marine Fisheries Service salmon smolt survival studies on the Columbia River, 1996.

Twentieth Century Distinguished Service Award in Environmental Statistics, Ninth Lukacs Symposium, 24 April, 1999.

Sesquicentennial Award of the Alaska Chapter of the American Statistical Association for the manuscript of greatest value to statistics in Alaska, 1991.

“Faculty Mentor” on two successful NSF Research Preparation Grants, an NSF initiative to help women and minorities get started in their research programs. Statistics Department representative at workshop “A Practical Approach to Mentoring,” Association for Women in Science, WISE Institute, 1996.

Elected Member, International Statistical Institute, 1995.

Founding member, President, and Secretary/Treasurer of the Alaska Chapter of the American Statistical Association, 1983-5. Council Representative to the American Statistical Association, 1987.

Associate Editor, *Environmental and Ecological Statistics*, 1993-present.
 Guest Editor, *Environmental and Ecological Statistics*, Special Issue on

Adaptive Sampling, 2002.

Currently Chair of Graduate Admissions Committee and Chair of Promotion and Tenure Committee for Department of Statistics, Pennsylvania State University.

Research Grants (sole PI)

1993-1996. Adaptive Sampling. National Science Foundation. \$60,000.

1996-2001. Adaptive Sampling. National Science Foundation. \$200,000.

Personnel supported: S.K. Thompson, PI, Chang-Tai Chao, Graduate Research Assistant; Jun Recta, David Heller, Gary Field, Computer Support.

1997-2001. Adaptive Sampling Methods for Elusive Human Populations.

National Institutes of Health, National Institute on Drug Abuse.

\$350,000. Personnel supported: S.K. Thompson, PI, Martina Morris, Faculty Associate; Linda Collins, Faculty Associate; ; Arthur Dryver, Graduate Research Assistant, Mosuk Chow, Faculty Associate, Martin Felix-Medina, Graduate Research Assistant, Wilson Khaemba, Postdoctoral Researcher.

1998-2001. Supplement to NIH/NIDA grant, for HIV/AIDS related sampling and inference methodology. \$175,000.

2001-2002. Investigation of Link Tracing Designs for National Health Surveys. National Center for Health Statistics. \$50,000.

2002-2003. Adaptive sampling for rapid response to bioterrorism events. National Center for Health Statistics. (With R. Shumway and D. Stoffer.) Feasibility study funded.

2002-2005. Adaptive sampling and interventions. National Science Foundation. Submitted.

Recent Invited Talks

Nominated to give ASA short course on Adaptive Sampling, sponsored by Survey Research Methods Section of the American Statistical Association, Joint Statistical Meetings, Toronto, August 2004. (Upcoming).

Organizer and chair of invited paper session "Sampling in a Network" at Joint Statistical Meetings, San Francisco, August 2003. Selected and sponsored by Survey Research Methods Section. (Upcoming)

"Adaptive sampling in environmental studies." Chinese Statistical Association, San Diego, June 20-22, 2003. (Upcoming)

- “Adaptive methods for rapid surveillance.” Workshop on Statistical and other Analytic Health Surveillance Methods. Center for Discrete Mathematics and Theoretical Computer Science (DIMACS), Rutgers University, June 17-20, 2003 (Upcoming).
- “Sampling in social networks.” Conference on Statistical Issues in Counterterrorism. National Academy of Sciences, Washington, D.C., May 29-30, 2003. (Upcoming).
- “Sampling and experiments,” International Biometric Society, Eastern North American Region, Tampa, FL, March 30-April 2, 2003. (Upcoming)
- “Design and inference for link-tracing designs in networks,” Conference in Honor of Prof. Gad Nathan: New Directions in the Production of Official Statistics, Eilat, Israel, 16-19 January 2003. (Cancelled in response to security concerns.)
- “Link-tracing designs,” Methodology Center Brown Bag Lunch Talks, Pennsylvania State University, 4 October 2002.
- “On optimal spatial designs.” Annual Meeting of the Statistical Society of Canada, Hamilton, Ontario. May 27, 2002.
- “Adaptive Sampling” and “Adaptive and link-tracing designs in epidemiology.” Department of Statistics, National Cheng Kung University, Tainan, Taiwan. Visit and talks funded by National Science Council of Taiwan and Taiwan Department of Education. May 16, 2002.
- “Adaptive sampling for natural and human populations.” National Chengchi University, Department of Statistics, Taipei, Taiwan. May 13, 2002.
- “Adaptive sampling.” Invited talk and workshop leadership. Eastern Nursing Research Society Annual Conference, Pennsylvania State University, University Park. March 21 2002.
- “Social network sampling design and estimation.” International Sunbelt Social Network Conference XXII, New Orleans. February 14, 2002.
- “Link-tracing designs.” Invited talk at National Center for Health Statistics, Hyattsville, MD (televised also for Centers for Disease Control, Atlanta, GA.). January 31, 2002.
- “Adaptive sampling for human and natural populations.” Department of Statistics, University of California, Santa Barbara, January 10, 2002.
- “Spatial sampling.” Invited talk and workshop leadership for Precision Agriculture Workshop, North Central Working Group (NCR-180), Pennsylvania State University, University Park. January 4, 2002.

- “Model-based Sampling of Social Networks,” presentation to Social Network Modeling Working Group, Center for Statistics and the Social Sciences, Departments of Statistics and Sociology, University of Washington, Seattle, 4 October 2001.
- “Adaptive Sampling of Human and Natural Populations,” Department of Statistics, Oregon State University, Corvallis, 1 October 2001.
- “Adaptive Network-Based Sampling,” Department of Statistics, University of Venice, Venice, Italy, 21 September 2001.
- “Advanced Topics in Adaptive Sampling,” Department of Statistics, University of Milan - Bicocca, Milan, Italy, four-day lecture series 17-20 September, 2001.
- “Random Walks and other Link-Tracing Designs,” Affiliated Systems Corporation, Houston, Texas, 16 August 2001.
- “Hard-To-Sample Populations,” Roundtable Discussion Leader, Joint Statistical Meetings, Atlanta, Georgia, 6 August 2001.
- “Adaptive Sampling for Human and Natural Populations,” Department of Statistics, University of Nebraska - Lincoln, 27 July 2001.
- “Adaptive Sampling for in Research on Risk-Related Behaviors,” Society for Prevention Research, Ninth Annual Meeting, Washington, D.C., 1 June 2001.
- “New Developments in Adaptive Sampling,” SPRUCE Advanced Workshop, Lisbon, Portugal, 21-24 March 2001.
- “Adaptive Sampling in Surveys, Experiments, and Observational Studies,” Royal Statistical Society, London, 26 March 2001.
- “Adaptive Sampling for Human and Natural Populations.” Department of Statistics, University of California, Los Angeles, California, 23 January 2001.
- “Adaptive Sampling in Spatial and Graph Settings.” International Conference Celebrating the Eightieth Birthday of Professor C.R. Rao, Indian Statistical Institute—Calcutta, Calcutta, India, 29 December 2000.
- “New Developments in Adaptive Sampling.” Fourth International Triennial Calcutta Symposium on Probability and Statistics, University of Calcutta, Calcutta, India, 28 December 2000.
- “Adaptive Sampling.” Indian Statistical Insitute—Delhi, Delhi, India, 22 December 2000.
- “Recent Developments in Adaptive Sampling.” International Conference on Statistics, Combinatorics, and Related areas, Indian Institute of

- Technology Bombay, Mumbai, India, 21 December 2000.
- “Adaptive Network-Based Sampling.” Trends in Social Science Methodology theme talk in International Conference on Social Science Methodology, Cologne, Germany, 4 October 2000.
- “Volunteer Bias in Sexuality Studies.” Seminar/workshop presented at Department of Clinical Psychology, University of Amsterdam, The Netherlands, 2 October 2000.
- “On Experiments and Sampling.” Fourth International Conference on Environmetrics and Chemometrics, Las Vegas, NV, 18 September 2000.
- “Sampling Rare Populations.” Discussant overview in Survey Research Section theme section of same title, Joint Statistical Meetings, Indianapolis, IN, 17 August 2000.
- “Adaptive Sampling for Hidden Populations.” International Conference in Honor of C.R. Rao on the Occasion of his 80th Birthday, University of Texas at San Antonio, 16 March 2000.
- “Design and Model Based Methods for Sampling Hidden Populations.” Invited talk at annual meeting of Dutch Statistical Society, Utrecht, The Netherlands, 8 March 2000.
- “Respondent-Driven Sampling Designs.” Second International Conference of Social Network Sampling, Maastricht, The Netherlands, 2 March 2000.
- “Adaptive Sampling in Graphs.” Seminar presented jointly to Department of Mathematics, Eindhoven University and Eurandom, The Netherlands, 23 February 2000.
- “Muestreo Adaptivo (Adaptive Sampling).” International Seminar on the Evaluation and Management of Benthic Resources, Viña Del Mar, Chile, August 31, 1999. cd “On Design and Model Based Approaches in Adaptive Sampling.” Ninth Lukacs Symposium, Bowling Green State University, Ohio, April 23, 1999.
- “Sampling in Social Networks—Some Design and Inference Methods.” 19th Sunbelt International Conference on Social Network Analysis, Charleston, South Carolina, February 21, 1999.
- “Sampling Hidden Populations.” Statistics Department, University of Maastricht, The Netherlands, December 14, 1998.
- “Sampling in Graphs.” Statistics Department, University of Groningen, The Netherlands, December 11, 1998.
- “Sampling Methods for Hidden Populations.” Affiliated Systems Incorporated, Houston, Texas, November 23, 1998.

- “Adaptive Sampling of Hidden Populations.” University of Washington, Center for AIDS and Sexually Transmitted Diseases, August 17, 1998.
- “Adaptive sampling in graphs,” Joint Statistical Meetings, American Statistical Association, Dallas, Texas, invited talk and Discussant for session “Application of Adaptive Cluster Sampling to Biological Populations,” August 10-13, 1998.
- “Adaptive Sampling.” National Institute of Statistics, Rome, Italy, invited short course, June 29-July 2, 1998.
- “Making Estimates with Link-Tracing Designs: Some Design and Model Based Methods.” 5th European International Conference on Social Networks, 18th Sunbelt International Conference on Social Network Analysis, Sitges, Spain, May 27-31, 1998.
- “Adaptive sampling,” University of Waterloo, Canada, Department of Statistics, invited talk and visit, November 1-7, 1997.
- “Adaptive sampling” and “Sampling in Graphs.” University of Florence, Italy, Department of Statistics, October 22-24, 1997.
- “Adaptive sampling” and “Design and inference issues in adaptive sampling,” University of Bologna, Italy, Department of Statistics, October 20-21, 1997.
- “Adaptive Sampling” (series of three talks) and “Sampling in Graphs.” University of Rome, Italy, Department of Statistics, October 6-17, 1997.
- “Adaptive sampling.” National Institute of Statistics, Rome, Italy, October 16, 1997.
- “Design and inference in environmental surveys.” Joint Annual Meetings of the American Statistical Association, The Biometric Society, and the Institute of Mathematical Statistics, Anaheim, California, August 14, 1997.
- “Statistical issues in link-tracing designs.” National Development and Research Institutes, New York, NY. June 9-10, 1997.
- “Adaptive sampling.” Keynote Address in Survey Sampling, Annual Meeting of the Statistical Society of Canada, Fredericton, New Brunswick, Canada, June 2, 1997.
- “Statistical issues in sampling and estimation for studies of drug users and other hidden human populations.” Prevention Research Center, Department of Health and Human Development, Pennsylvania State University. Invited seminar, April 29, 1997.
- “Design and inference issues in sampling.” Statistics in the 21st Century, Montreal, Quebec, Canada, November 30, 1996.

- “Adaptive sampling.” Department of Statistics, Wharton School, University of Pennsylvania, October 9, 1996.
- “Adaptive sampling.” Mathematics Unit, St Andrews University, St Andrews, Scotland, September 30, 1996.
- “Adaptive sampling.” Department of Mathematics, University of Oslo, Norway, September 26, 1996.
- “Design and inference issues in sampling.” Department of Statistics, University of Stockholm, Sweden, September 25, 1996.
- “Adaptive sampling.” Department of Statistics, University of Stockholm, Sweden, September 20, 1996.
- “Adaptive Sampling.” Pennsylvania State University, Summer Seminar Series, June 27, 1996.
- “Effective sampling strategies for spatial problems.” University d’Annunzio, Pescara, Italy, June 17, 1996,
- “Adaptive sampling in environmental studies.” University of Siena, Italy, June 12, 1996,
- “Adaptive sampling strategies.” Department of Statistics, New York University, Symposium on Recent Developments in Sampling, May 17, 1996.
- “Issues in adaptive sampling.” Department of Mathematics and Statistics, American University, May 7, 1996.
- “Issues in adaptive graph sampling.” International Social Network Conference, International Network for Social Network Analysis (INSNA) and Department of Sociology, University of South Carolina, Charleston, SC, February 24, 1996.
- “Adaptive sampling strategies.” Institute of Ecosystem Studies, Millbrook, NY, January 26, 1996,
- “Spatial sampling.” Ciba Foundation Symposium No. 210, Precision Agriculture: Spatial and Temporal Variability of Environmental Quality, Wageningen, The Netherlands, January 21, 1996.

Ph.D. Students and Graduates for whom I have served as Thesis Adviser

Michael Kwanisai, current Ph.D. student.

Hong Xu, current Ph.D. student.

Martin Felix-Medina, Ph.D. completed summer 2000. Present position: Assistant Professor and Director of the School of Mathematical and Physical Sciences, University of Sinaloa, Mexico.

Arthur Dryver, Ph. D. completed summer 1999. Present position:
Statistician, Anabus, Philadelphia.

Chang-Tai Chao, Ph. D. completed summer 1999. Present position:
Assistant Professor, Department of Statistics National Cheng-Kung
University Tainan, Taiwan.

Postdoctoral Researcher Supervised:

Wilson S. Khaemba. Dr. Khaemba is supported by my NIH grant
Supplement.

Memberships

American Statistical Association (Fellow)
International Statistical Institute (Elected member)
The International Biometric Society.
The Institute of Mathematical Statistics.
International Network for Social Network Analysis.
The American Association for the Advancement of Science.