

# Stanford University Department of Statistics

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The teaching of statistics has a long history at Stanford prior to the formation of a statistics department. The university was founded in 1891, and starting in the early 1920s, courses in statistics appeared in a number of departments, each emphasizing a different aspect of the field.

## The Early Years: 1920–1930

In 1920, the School of Education listed a course called *EDUC 3: Educational Statistics* with the following description: “This course will deal with the theoretical and practical aspects of statistical methods as applied to education, including scale, units, and standards.” The instructor was Truman Lee Kelley, who had just joined the faculty and who taught courses in statistics and psychometry (a precursor to psychometrics) until 1931 when he migrated to Harvard. Kelley was a joint author of the Stanford Achievement Test Battery and the author of the book *Statistical Methods* in 1924. This was also the early development of mental testing that was pioneered by Lewis Madison Terman, the inventor of the Stanford-Binet IQ test. Terman was also a leading developer of the field of educational psychology, now the area responsible for statistics in schools of education. In 1921, Terman started a longitudinal study of gifted children titled *Genetic Studies of Genius*. This study has continued to this day.

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From 1916 to 1925, the Department of Psychology introduced a number of statistics courses. One such (*PSYCH 8*) stated that “sound knowledge of algebra is a prerequisite.” One of the books to be used was that of G. Udny Yule. This course was “a lecture and seminar course covering the theory of chance, and the application of statistical methods developed from the mathematical theory of probability to experimental psychical research.” In 1924, there is the first appearance of an advanced course, *Advanced Statistical Methods*, taught by Truman Kelley; this included a discussion of the analysis of correlated data, multiple correlation, and categorical data.

The Department of Economics introduced a course in 1919/1920, *ECON 6: Introduction to Statistics* with the description: “A study of elementary statistical methods appropriate for dealing with problems in the social sciences and business.” The Department of Political Science introduced its statistics course in 1925/1926. *POL.SCI119: Quantitative Studies in Politics and Administration* was aimed at students “interested in the problem of methods in the measurement and analysis of political phenomena.”

Eugene L. Grant joined the Engineering faculty in 1929 and introduced the course *Civil Eng 132: Statistics in Engineering* which focused on statistical methods in the inspection of manufactured products. This was later expanded into a department of industrial engineering.

The year 1924 is singular in that Harold Hotelling joined the faculty in the Food Research Institute, and subsequently in the Department of Mathematics. Hotelling was one of the statistical luminaries of the twentieth century, known for the development of principal components, canonical correlations, and the multivariate generalization of Student’s *t*-statistics. Hotelling’s course was *Math 175: Theory of Probability and of Statistical Inference*, and may be one of the earliest courses in Mathematical Statistics. The description includes “considerable material relating to statistical methods and theories which is found in memoirs but in no textbook”. One of the topics was “Law of Great Numbers,” which is Hotelling’s translation of Poisson’s paper “La loi des grands nombres” and is now generally called Law of Large Numbers. It may be of interest to note that Holbrook Working joined the Food Research Institute and he and Hotelling developed simultaneous confidence regions for a regression line, a procedure named after them; see *JASA 24: 73–85* (1929). Hotelling left for Columbia in 1931, where he was instrumental in attracting an eminent group of statisticians.

The mathematical foundation of probability and statistics was strengthened when James Victor Uspensky joined the mathematics faculty in 1929. His 1937 book “*Introduction to Mathematical Probability*” is one of the early textbooks on the mathematics of probability. He regularly taught the course *Theory of Probability*.

## **The Pre-department Years: 1930–1948**

By 1930, statistics courses appeared in the departments of education, psychology, economics, political science, civil engineering, and mathematics. Because

statistics courses were not centralized, the 1930 catalog has a listing labeled “Statistics” with this comment: “As a result of the increasing interest in the field of statistics, the following courses presented in several departments are listed for the information of students in this field. No formal departmental or divisional organization is involved.”

In 1934, Stanford offered its first degree program in statistics in the form of a minor subject to a Doctor of Philosophy. The task of administering curricula for that degree was delegated to a Committee on Instruction of Statistics. This committee consisted of John B. Canning (Economics) as chairman, Theodore J. Kreps (Graduate School of Business), and James V. Uspensky (Mathematics). The composition of this committee varied slightly from year to year among the faculty with a strong interest in Statistics: Harold M. Bacon (Mathematics), Quinn McNemar (Psychology and Education), Frank W. Weymouth (Biological Sciences), Holbrook Working (Economics), Eugene L. Grant (Economics and Civil Engineering), and, starting with his arrival at the Stanford Mathematics Department in 1942, George Pólya was continuously involved with this committee.

Pólya taught a course on mathematical statistics almost every year and is considered to be one of the greatest teachers in the field of mathematics. His books on problem solving and plausible reasoning are classics in mathematical education. When he retired in 1953, he was called back to service and taught until his ninety-first year. The mathematics department had a regular offering of courses related to statistics, growing from two courses in 1933 (*Theory of Probability* by Uspensky and *Statistical Inference* by Bacon) to four courses in 1948 (in addition to the above, there was the course *Mathematical Statistics* and a *Colloquium in Statistics*). The departmental listings of 1946 already include Albert Bowker and Herbert Solomon, although Bowker taught statistics courses in a variety of departments, such as a course in economics in 1946 and *Advanced Statistics in Engineering* in 1947.

The department with the largest offering of statistics courses at that time was Economics, where in 1936 statistics was listed as one of nine major subfields. The *Stanford Bulletin* for that year lists the courses *Elementary Statistical Operations*, *Introduction to Statistical Inference I and II*, *Advanced Statistics I and II*, which dealt with topics such as goodness of fit and the fitting of frequency curves, and a *Seminar in Advanced Statistics*. Faculty included John Canning and Holbrook Working. This center for statistics was further strengthened in 1938 with the arrival of W. Allen Wallis, but the Economics Department resisted the creation of a separate Statistics Department. As reported by Stigler (1999), as late as 1947, Holbrook Working wrote, “It seems to me that Stanford has little excuse for entering into competition with Berkeley in offering intensive training in mathematical statistics,” and a report from the Chairman of the Economics Department concluded:

It is our feeling that it is very important that instruction in the applications of statistical technique should continue to be under the departments in whose subjects the applications of statistical technique are made.... Both statistics and economics gain if statistical work is done by economists.

The controversy of statistics distributed across fields of application versus statistics collected as a central core continues to this day. The 1941 paper by Hotelling on “*The teaching of statistics*” was very influential in the move toward a central core. Jerzy Neyman, the founder of the Department of Statistics at Berkeley, cites this paper as providing the basis for the centralization of statistics in U.S. universities.

The effort to create a separate department suffered an additional setback when Wallis left in 1942 to run the Statistical Research Group at Columbia. However, before he left, Wallis hired Al Bowker, and then, as Stigler (1999) reports, “recommended adding Abe Girshick to Al to form the nucleus of a new group, admitting that Girshick had ‘no administrative ability. Since Bowker does have, however, they should make an excellent team.’” Bowker had studied under Harold Hotelling at Columbia and North Carolina.

Another stronghold of statistics at that time can be found in Education and in Psychology, with the offerings *Elementary Statistical Methods*, *Introduction to Statistical Methods*, and *Advanced Statistical Methods I and II*. Those courses were partly taught by Quinn McNemar, whom the *Bulletin* of 1934 lists as an Instructor in Education and Psychology.

The Department of Biological Sciences lists courses named *Biometry* and *Biometrical Analysis* taught by Frank Weymouth, and in the Department of Civil Engineering, E. Grant was teaching the courses *Statistics in Engineering*, *Advanced Statistics in Engineering*, and, starting in 1945, *Quality Control by Statistical Methods*. Felix Bloch, who in 1952 would share the Nobel Prize in Physics, annually taught a course in statistical mechanics, beginning upon his arrival at Stanford in 1934. Although not a statistics course, it had a component of stochastic processes and combinatorics and was of interest to physicists. It was later that analysts recognized that it involved large deviations with dependent variables.

## Formation of the Department of Statistics

The history of the formation in 1948 of the Department of Statistics has been documented in several sources. Royden (1989) provides a history of mathematics and statistics. The department celebrated its fiftieth anniversary in 1998, at which time Stephen Stigler gave a talk on the origins of the department (Stigler 1999). In brief, Allen Wallis joined the Stanford Department of Economics in 1938, with responsibility for the teaching of statistics. With the start of the war he moved to Columbia to run the Statistical Research Group (SRG). Bowker was a student at Columbia and worked on sampling inspection problems with the SRG. Before leaving Stanford, Wallis urged the Mathematics Department to hire Bowker, and he joined the faculty in 1947. Wallis also recommended hiring Abraham Girshick (then at the Rand Corporation) with the suggestion that Bowker be chair of a department of statistics. The department was founded in 1948 and by 1950 had a faculty of five: Bowker and Girshick, Quinn McNemar (joint with Psychology), Kenneth Arrow (joint with Economics), and Herman Rubin. David Blackwell was

a visitor, and it was during this time that he and Girshick wrote their book on decision theory (Blackwell and Girshick 1954). By 1956, Bowker brought Herman Chernoff, Charles Stein, Lincoln Moses, Gerald Lieberman, and Samuel Karlin into the department. Thus, in less than a decade the department reached adulthood.

The next 5 years (1956–1961) saw astounding growth in the university. The Medical School was moved to the campus and the Stanford Linear Accelerator was created. The department was part of this growth when Emmanuel Parzen, Vernon Johns, Herbert Scarf, Herbert Solomon, William Madow, Rupert Miller, Harvey Wagner, Kai Lai Chung, Patrick Suppes, Hirofumi Ozawa, and Ingram Olkin all joined the faculty. Bowker's administrative genius was to recognize that statistics alone would not be able to sustain a large department. However, by generating a liaison with other departments in the form of joint appointments, the department could have an impact in the university and also carry out a research agenda in various substantive fields.

Over the years, there have been joint appointments with Economics (Anderson, Arrow, Romano), Mathematics (Candes, Dembo, Diaconis, Karlin), Earth Sciences (Rajaratnam, Switzer), Education (Olkin), School of Medicine (Efron, Hastie, Johnstone, Lai, Miller, Moses, Tibshirani, Wong), Operations Research (Lieberman), Symbolic Systems (Holmes), SLAC (Friedman), Electrical Engineering (Cover, Montanari), and Psychology (McNemar).

The following is an excerpt from a letter written by Bowker to Wallace Sterling on May 1951, when Sterling was President of the university:

Our Statistics Department has been integrated quite successfully into the general university program. Professor McKinsey in Philosophy and Professor Grant Ireson in Industrial Engineering have been brought to Stanford by funds provided by our projects; Professor Hans Lewy, a very distinguished applied mathematician works on one of our programs. Faculty from the Departments of Mechanical Engineering, Civil Engineering, Economics, Philosophy, and Mathematics are all associated with research programs we have developed, and members of our staff have worked either as collaborators or as statistical consultants with faculty from the Medical School, the Graduate School of Business, the Hoover Library, the Food Research Institute, the School of Mineral Sciences, as well as the Departments of Physics, Mathematics, Philosophy, Economics, Psychology, Sociology and Anthropology, and Biology.

A second factor that impacted the growth of the department was the support of the Office of Naval Research (ONR). As noted by Mina Rees in 1980 when she was Director of ONR, support of Mathematics was provided to NYU, MIT, Stanford, Berkeley, and Tulane. Bowker recommended the establishment of a laboratory, the Applied Mathematics and Statistics Laboratory (AMSL) that was a channel for obtaining funding from the Federal government. The AMSL supported a broadly defined field of mathematical sciences that included core and applied mathematics, statistical decision theory, game theory, mathematical economics, inventory theory, mathematical psychology, as well as general mathematical statistics and applied statistics.

The combination of an exciting department, proximity to the activities at Berkeley, and the California weather created a domain of attraction at Stanford.

There were many postdocs who went on to become well known. A large number of visitors on sabbatical leave chose to spend a year at Stanford. A perusal of publications written jointly with the Stanford faculty in the early years will vividly show the influence of the department.

## Students

The first doctorates were awarded to Herbert Solomon (1950) and Lincoln Moses (1951). Since then, over 400 doctorates and over 1600 Master's degrees have been awarded.

Decade	Master's degrees	PhD degrees
1948–1960	75 <sup>a</sup>	29
1961–1970	403	84
1971–1980	275	74
1981–1990	281	68
1991–2000	255	69
2001–2010	344	84
Totals	1,633	408

<sup>a</sup> Data available beginning with academic year 1953–1954

Our students have had a great impact on the profession. Many have been chairs, and it is hard to find a campus that does not have a faculty member influenced by our department either as a student, or as a faculty who visited our campus.

The department offered a Bachelor's degree for a number of years, but the number of students was small. Instead, a joint degree that included mathematics, statistics, applied mathematics, and computer science was created. This degree, called "Mathematical and Computational Science", has been highly successful, with a 2010 graduating class of 22.

With the growth of computing and data analysis, the master's degree has become very popular. Also, students in doctoral programs in other fields find a master's degree in Statistics to be very useful and advantageous.

The university established a series of fellowships in 1993 in honor of Gerald J. Lieberman. The fellowships are awarded to outstanding advanced doctoral students who intend to pursue a career in university teaching and research. In 2011, the department established the Charles Stein Fellowship in Statistics that is designed to be a post-doctoral career-building step for new scholars.

## Faculty

The list of faculty is long and is provided on the website for this book. The present faculty, as of December 2010, listed in order of longevity within the department (dating from first appointment) are: Charles Stein (1953, emeritus); Ingram Olkin

(1961, emeritus); Patrick Suppes (1961, courtesy/emeritus); Bradley Efron (1965); Paul Switzer (1966, emeritus); Theodore Anderson (1967, emeritus); Richard Olshen (1967; 1990, courtesy); David Siegmund (1967); Thomas Cover (1970); Persi Diaconis (1974); Jerome Friedman (1981, emeritus); Iain Johnstone (1981); Art Owen (1985); Joseph Romano (1986); Tze Leung Lai (1987); David Rogosa (1987, courtesy); Helena Kraemer (1988, courtesy/emerita); Amir Dembo (1990); David Donoho (1991); Trevor Hastie (1994); Guenther Walther (1994); Balasubramanian Narasimhan (1996); Charles Chui (1997, consulting); Susan Holmes (1998); Robert Tibshirani (1998); Jonathan Taylor (2001); Wing Hung Wong (2004); Andrea Montanari (2006); Nancy Zhang (2006); Simon Jackman (2007, courtesy); John Chambers (2008, consulting); Philip Lavori (2008, courtesy); Emmanuel Candès (2009); Jacqueline Meulman (2009, visiting); Balakanapathy Rajaratnam (2009); Chiara Sabatti (2009, courtesy), Hua Tang (2010, courtesy).

When Bowker became Dean of Graduate Studies in 1958, Herbert Solomon became Chair of the department. Solomon served vigorously as Chairman from 1959 to 1964, and thereafter the department moved to a 3-year, non-self-succeeding chairmanship. To date, 14 faculty have served as Chair: Bowker, Chernoff, Efron, Friedman, Hastie, Johnstone, Lai, Miller, Moses, Olkin, Siegmund, Solomon, Switzer, and Wong. This has had an advantage in that each Chair has been able to negotiate some feature to improve the department.

After Rupert Miller's untimely death in 1986, the department created a lectureship in his honor. The first speaker was Sir David Cox in 1987, followed by John Tukey in 1989, and Fred Mosteller in 1980. Other speakers were Norm Breslow in 1994 and Anastasios Tsiatis in 2002.

## **Biostatistics**

Lincoln Moses joined the faculty in 1953 as a joint appointment between Community Medicine and Statistics. At the time, the School of Medicine was housed in San Francisco. In 1959, the School of Medicine moved to the Stanford campus, and biostatistics became a division in what was the Department of Community Medicine. Rupert Miller joined the Division, again with a joint appointment. Byron Brown and Bradley Efron were later added to the group. They were successful in being awarded the NIH Training Grant (with Miller as principal investigator) that supported a number of students interested in biostatistics. This was a very vibrant group. Although these students "majored" in biostatistics, their training was identical to that of the other students. There was no distinction based on the field of interest, whether biostatistics, psychology, education, and so on, in the training that students received. In 1988, the Division of Biostatistics became one of three arms in the Department of Health Research and Policy, where it remains today. Its faculty has grown considerably, with much interaction between Biostatistics and Statistics. The current key personnel who are affiliated with the Department of Statistics are Bradley Efron, Trevor Hastie, Iain Johnstone, Philip

Lavori, Balasubramanian Narasimhan, Richard Olshen, Chiara Sabatti, Robert Tibshirani, and Wing Wong.

## Doctoral Courses

The following is a list of doctoral-level courses 25 years apart. This provides a trajectory of the development of Statistics at Stanford and reflects the changes in the profession.

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### Courses in 1960

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220a,b	Estimation and testing hypothesis
224a,b	Multivariate analysis
230a,b,c	Advanced probability
234	Time series analysis
235a,b	Non-parametric statistical inference
236a,b,c	Decision theory and statistical inference
242a,b,c	Stochastic processes
244a,b	Large-sample theory

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### Courses in 1985

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230a,b	Advanced probability
233a,b,c	Applied statistics
236a,b,c	Theoretical statistics
314	Inequalities: Theory and applications
317, 318	Stochastic processes
324	Multivariate analysis
326	Sequential analysis
332	Asymptotic methods in statistics
333	Robust estimation
336a,b	Decision theory and statistical inference
343a,b	Time series analysis
350	Topics in probability theory
351	Geometric probability and applications
358	Queueing theory
359	Applied probability
360	Applied stochastic processes: Control and information
361	Statistical pattern recognition and robustness
362	Information and statistics
364	Topics in gambling and investing
376	Information theory

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 Courses in 2010
 

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300a,b,c	Theory of statistics
305	Introduction to statistical modeling
306a,b	Methods of applied statistics
310a,b,c	Theory of probability
314	Advanced statistical methods
315a,b	Modern applied statistics: Learning, data mining
316	Stochastic processes on graphs
317	Stochastic processes
320	Heterogeneous data with kernels
322	Function estimation in white noise
324	Multivariate analysis
329	Large-scale simultaneous inference
330	Introduction to compressed sensing
345	Computational algorithms for statistical genetics
351a	Introduction to random matrix theory
352	Spatial statistics
362	Computational biology
367	Statistical models in genetics
370	A course in Bayesian statistics
375	Inference in graphical models

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## Sequoia Hall

The Department of Statistics was housed in a block-style building that was part of the early construction on campus. As Stanford was conceived to be a coeducational institution from the start, Sequoia Hall dated from 1891 and was designed to be the first dormitory for women. As such, it had large parlors, high ceilings, and wide hallways. The reinforced-concrete structure included three stories, but in later decades the upper two floors were closed for occupancy due to seismic safety concerns and then removed altogether.

From 1948 until 1964, Sequoia Hall was home to some mathematicians (e.g., Paul Garabedian, George Forsythe, Stephen Bergmann) and all the statisticians. The Mathematics Department moved to a central part of the campus in 1964, thereby leaving Sequoia Hall to Statistics. Early on there was sufficient room for students and faculty, but the building was increasingly in disrepair. The old Sequoia Hall was demolished in 1996 and a new Sequoia Hall was dedicated on nearly the same site in 1998, the first building to be completed as part of the new Science and Engineering Quad. New Sequoia Hall aligns with the historic Main Quad, with an updated stone veneer and clay tile roof that reflects that early design. There is now a high-ceilinged lobby with a curving staircase leading up to the second floor beneath a skylight, as well as a library, lounge, and classroom.

The wide hallways were maintained (after considerable discussion with the architects) and they still provide easy collaboration between colleagues.

The effects of an architectural structure may not seem to be important at first glance. However, in the present case, this building is one of the features at Stanford that is almost always remembered for generating a friendly atmosphere within its walls.

## Joint Colloquia with Berkeley

There has always been a sense of camaraderie (both socially and scientifically) between the two Statistics departments. Erich Lehmann in writing his reminiscences describes many of the connections between the two departments (Lehmann 2008). The Stanford/Berkeley (and Berkeley/Stanford) Joint Colloquia have become a tradition that is well remembered by faculty and students as well as the many visitors to the two Bay Area institutions. In the early days, there were three joint colloquia every quarter; now there are three events per year, held in alternating locations.

## Honors and Awards

Members of the department, past and present have been recognized in many ways, and only a few honors and awards are cited here. Many of the faculty have given named lectures such as the Wald, Fisher, and Medallion lectures.

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National medal of science	Arrow, Efron, Karlin
Nobel Prize in Economics	Arrow
Norbert Wiener Prize in Applied Mathematics	Donoho
McArthur Fellows	Diaconis, Donoho, Efron
National Academy of Sciences	Anderson, Arrow, Diaconis, Donoho, Efron, Friedman, Johnstone, Siegmund, Stein, Wong
National Academy of Education	Olkin
Norwegian Academy of Science and Letters	Anderson
French Academy of Sciences	Donoho
Guggenheim Fellow	Anderson, Arrow, Olkin, Olshen, Siegmund
George Pólya Prize	Candès
Guy Medal in Silver	Johnstone
COPSS President's Award	Donoho, Johnstone, Lai, Tibshirani, Wong
National Science Foundation Waterman Award	Candès

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## Role in the University

Although the department is a relatively small one, it has been very influential in the university. Indeed, many members of the department have served the university in a number of administrative roles:

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Provost	Lieberman
Vice Provost and Dean of Graduate Studies and Research	Lieberman
Dean of Graduate Studies	Bowker
Associate Dean of Humanities and Sciences	Efron, Johnstone, Lieberman, Moses, Siegmund
Vice-Dean for Academic Planning, H&S	Johnstone
Director, Public Policy Program, H&S	Moses

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## Research Areas of Faculty

Biological applications (Narasimhan, Zhang)  
 Bootstrap methods (Efron, Romano, Tibshirani)  
 Classification (Olshen)  
 Combinatorics (Diaconis)  
 Communication theory (Cover)  
 Computational biology (Wong)  
 Computational methods (Narasimhan)  
 Computational statistics (Donoho, Holmes, Walther)  
 Data mining (Hastie, Holmes, Friedman)  
 Decision theory (Stein)  
 Econometrics (Anderson, Romano)  
 Empirical likelihood (Owen)  
 Environmental statistics (Switzer)  
 Financial mathematics (Lai)  
 Genetics (Siegmund, Zhang)  
 Gaussian processes (Taylor)  
 Graphical models (Montanari, Rajaratnam)  
 Inequalities (Olkin)  
 Information theory (Cover, Dembo, Montanari)  
 Imaging sciences (Candès)  
 Longitudinal data (Olshen)  
 Meta-analysis (Olkin)  
 Monte Carlo methods (Diaconis, Owen)  
 Machine learning (Friedman, Hastie, Tibshirani)  
 Multivariate analysis (Anderson, Johnstone, Olkin, Rajaratnam, Stein)

Multiple comparisons (Efron, Taylor)  
 Nonparametric analysis (Owen, Romano, Switzer, Walther)  
 Sequential analysis (Lai, Siegmund)  
 Spatial statistics (Switzer)  
 Stochastic processes (Dembo, Lai, Siegmund)  
 Signal processing (Candès, Donoho, Johnstone)  
 Statistical inference (Wong)  
 Time series (Anderson)

## Books Published by Faculty 2000–2010

Anderson, T.W. (2003). *An Introduction to Multivariate Statistical Analysis*, 3<sup>rd</sup> ed. Wiley Series in Probability and Statistics. Wiley-Interscience, New York.

Efron, Bradley (2010). *Large-Scale Inference: Empirical Bayes Methods for Estimation, Testing, and Prediction*. Institute of Mathematical Statistics Monographs I, Cambridge University Press, Cambridge.

Hastie, T., R. Tibshirani and J. Friedman (2001, 2009). *The Elements of Statistical Learning: Prediction, Inference, and Data Mining*, 1<sup>st</sup> and 2<sup>nd</sup> ed. Springer Series in Statistics. Springer-Verlag, New York.

Lai, T.L. with V. de la Pena and Q.M. Shao (2009). *Self-Normalized Processes: Limit Theory and Statistical Applications*. Probability and its Applications. Springer, New York.

Olkin, I. with A.W. Marshall (2007). *Life Distributions: Structure of Nonparametric, Semi-Parametric, and Parametric Families*. Springer Series in Statistics. Springer, New York.

Olkin, I. with A.W. Marshall and B. Arnold (2010). *Inequalities: Theory of Majorization and Applications*, 2<sup>nd</sup> ed. Springer Series in Statistics. Springer, New York.

Owen, A.B. (2001). *Empirical Likelihood*. Monographs on Statistics and Applied Probability 92. Chapman and Hall/CRC Press, Boca Raton, FL.

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Romano, J.P. with E.L. Lehmann (2005). *Testing Statistical Hypotheses*, 3<sup>rd</sup> ed. Springer Texts in Statistics. Springer, New York.

## Further History

History often changes with the perspective of the author. The publication of conversations with individual faculty will provide further details of the growth of the department.



Three faculty, Kenneth J. Arrow, David Blackwell, and Abraham Girshick (from left to right), at the time the Department of Statistics was formed.



Key figures in the development of the Statistics Department were (from left to right) Albert Bowker, Gerald Lieberman, Lincoln Moses, and Herbert Solomon.

### ***Published Interviews with Stanford Faculty***

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- Phillips, P.C.B. (1986). The ET interview: Professor T.W. Anderson. *Econometric Theory* **2**, 249–288.
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- Sampson, A.R. (2007). A conversation with Ingram Olkin. *Statistical Science* **22**, 450–475.

### **Articles that Relate to the Statistics Department**

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- Rees, M. (1980). The mathematical sciences and World War II. *American Mathematical Monthly* **87**, 607–621.
- Hollander, M. and Marshall, A.W. (1995). A conversation with Frank Proschan. *Statistical Science* **10**, 118–133.
- Bather, J. (1996). A conversation with Herman Chernoff. *Statistical Science* **11**, 335–350.
- Newton, H. J. (2002). A conversation with Emanuel Parzen. *Statistical Science* **17**, 357–378.

**Acknowledgments** The authors are grateful to the Institute of Mathematical Statistics for permission to reprint the photograph of our founding faculty.

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