# Timeline - Statistik Einführung

Lehrstuhl für Psychologische Methodenlehre, Evaluation und Statistik Universität Zürich


Pappos von Alexandria

*4. Jahrhundert* **Mittelwert**

In der Mathematik treten Mittelwerte, insbesondere die drei klassischen Mittelwerte (arithmetisches, geometrisches und harmonisches Mittel), bereits in der Antike auf. Pappos von Alexandria kennzeichnet 10 verschiedene Mittelwerte $m$ von 2 Zahlen $a$ und $b$ ($a < b$) durch spezielle Werte des Streckenverhältnisses $(b - m) : (m - a)$.

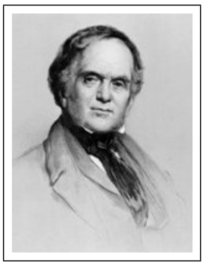
Quelle: Wikipedia


Jakob Bernoulli

*1713* **Binomialverteilung**

Swiss mathematician Jakob Bernoulli, in a proof published posthumously in 1713, determined that the probability of k such outcomes in n repetitions is equal to the k-th term (where $k$ starts with 0) in the expansion of the binomial expression $(p+q)n$, where $q = 1 - p$.

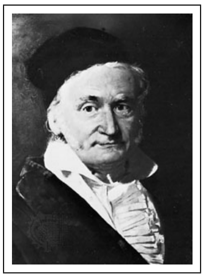
Quelle: Encyclopaedia Britannica


William Playfair

*1786* **Balkendiagramm, Kreisdiagramm**

William Playfair (22 September 1759 — 11 February 1823) was a Scottish engineer and political economist, the founder of graphical methods of statistics. William Playfair invented four types of diagrams: in 1786 the line graph and bar chart of economic data, and in 1801 the pie chart and circle graph, used to show part-whole relations. The earliest known pie chart is generally credited to William Playfair's Statistical Breviary of 1801.

Quelle: Wikipedia

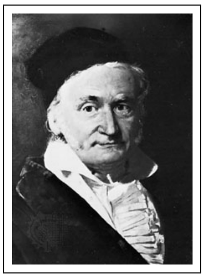

Carl Friedrich Gauss

*1801* **kleinste Quadrate Schätzung**

In 1801 Gauss employed his 'least squares' approximation method, which fits a regression line to a set of data, to calculate the orbit of Ceres.
Legendre's Nouvelles méthodes pour la détermination des orbites des comètes (1806; "New Methods for the Determination of Comet Orbits") contains the first comprehensive treatment of the method of least squares, although priority for its discovery is shared with his German rival Carl Friedrich Gauss.

Quelle: Science Time Line, Encyclopaedia Britannica


Adrien-Marie Legendre

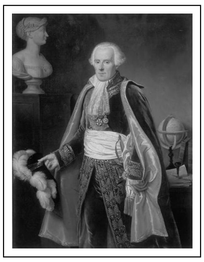


Carl Friedrich Gauss

*1809* **Normalverteilung**

The term “Gaussian distribution” refers to the German mathematician Carl Friedrich Gauss, who first developed a two-parameter exponential function in 1809 in connection with studies of astronomical observation errors.

Quelle: Encyclopaedia Britannica



Pierre-Simon Laplace

*1810* **Zentraler Grenzwertsatz**

Laplace published a Bayesian precursor of the Central Limit Theorem (CLT) in 1785, establishing the asymptotic normality of posterior distributions. In 1810, however, Laplace introduced the CLT as it applies to frequentist inference, and as it is mostly known today.

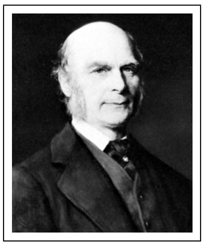
Quelle: Wikipedia

Thomas Bayes

*1812* **Satz von Bayes**

In probability theory and statistics, Bayes’ theorem relates current probability to prior probability. It is named after Reverend Thomas Bayes (1701–1761), who first showed how to use new evidence to update beliefs. Bayes’ unpublished manuscript was significantly edited by Richard Price before it was posthumously read at the Royal Society.

Quelle: Wikipedia

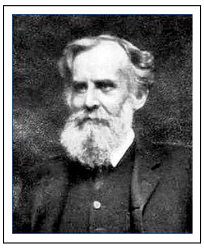


Francis Galton

*1869* **Standardabweichung**

In 1869, Francis Galton suggested a genetic basis for intelligence. He established that the science of heredity could be concerned with deviations measured in statistical units. His discovery of the standard deviation gave him the mathematical machinery to handle variability and to treat population as a unit of explanation.

Quelle: Wikipedia

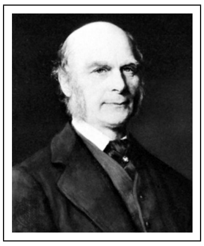


John Venn

*1880* **Venn Diagramm**

Venn diagrams were conceived around 1880 by John Venn. Venn himself did not use the term „Venn diagram“ and referred to his invention as „Eulerian Circles“. For example, in the opening sentence of his 1880 article Venn writes, „Schemes of diagrammatic representation have been so familiarly introduced into logical treatises during the last century or so, that many readers, even those who have made no professional study of logic, may be supposed to be acquainted with the general nature and object of such devices. Of these schemes one only, viz. that commonly called 'Eulerian circles,' has met with any general acceptance...“

Quelle: Wikipedia



Francis Galton

*1888* **Lineare Regression**

An examination of publications of Sir Francis Galton and Karl Pearson reveales that Galton's work on inherited characteristics of sweet peas led to the initial conceptualization of linear regression. Subsequent efforts by Galton and Pearson brought about the more general techniques of multiple regression and the product-moment correlation coefficient.

Quelle: Journal of Statistics Education

Karl Pearson

*1896* **Korrelation nach Bravais und Pearson**

In 1896, Pearson published his first rigorous treatment of correlation and regression in the Philosophical Transactions of the Royal Society of London. In this paper, Pearson credited Bravais (1846) with ascertaining the initial mathematical formulae for correlation. Pearson noted that Bravais happened upon the product-moment (that is, the „moment“ or mean of a set of products) method for calculating the correlation coefficient but failed to prove that this provided the best fit to the data.

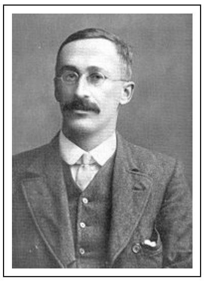
Quelle: Journal of Statistics Education

Karl Pearson

*1900* **$\chi^2$-Unabhängigkeitstest**

In 1900, Karl Pearson developed the chi-square test, a statistical procedure that enables the determination of how closely an experimental set of values conforms to theoretical expectation.

Quelle: Science Time Line



William Sealy Gosset

*1908* **Ein-Stichproben t-Test**

The the *t*-test and *t* distribution was developed and introduced in 1908 by the Englishman William Sealy Gosset, a chemist working for the Guinness brewery in Dublin, Ireland. He published under the pseudonym „Student“ which was his pen name.

Quelle: Encyclopaedia Britannica

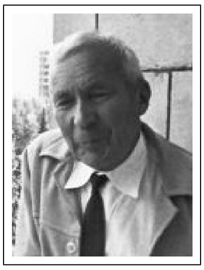
Sir Ronald Fisher

Jerzy Neyman

*1933* **Theorie statistischer Tests**

In the development of classical statistics in the second quarter of the 20th century, two competing models of inductive statistical testing were developed. While a hybrid of the two methods is widely taught and used [today], the philosophical questions raised in the debate have not been resolved.
[Fisher's] significance test might be simplistically stated, „If the evidence is sufficiently discordant with the hypothesis, reject the hypothesis“.
[Jerzy] Neyman & [Egon Sharpe] Pearson collaborated on a different, but related, problem – selecting among competing hypotheses based on the experimental evidence alone.
Textbooks provided a hybrid version of significance and hypothesis testing by 1940.

Quelle: Wikipedia



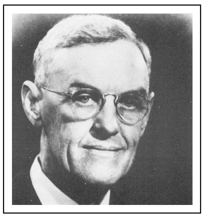
Andrey N. Kolmogorov

*1933* **Axiome von Kolmogorov**

The mathematical theory of probability has its roots in attempts to analyze games of chance by Gerolamo Cardano in the sixteenth century, and by Pierre de Fermat and Blaise Pascal in the seventeenth century (for example the „problem of points“). Initially, probability theory mainly considered discrete events, and its methods were mainly combinatorial. Eventually, analytical considerations compelled the incorporation of continuous variables into the theory. Kolmogorov combined the notion of sample space and measure theory and presented his axiom system for probability theory in 1933.

Quelle: Wikipedia

Sir Ronald Fisher



George W. Snedecor

*1935* **Varianzanalyse, F-Verteilung**

Die Entwicklung der Methoden der Varianzanalyse von Sir Ronald Aylmer Fisher, der erstmals im Jahre 1935 mit Erscheinen seines Buches „The Design of Experiments“ eine ausführliche Darstellung von Varanzanalyse und Versuchsplanung veröffentlichte, wurde erst durch die Ableitung der F-Verteilung durch George W. Snedecor möglich; den Namen F-Verteilung erhielt diese Verteilung zu Ehren Fishers.

Quelle: Wikipedia (Fisher), Wikipedia (F-Verteilung)

Carlo Emilio Bonferroni

*1936* **Bonferroni Korrektur**

Carlo Emilio Bonferroni was an Italian mathematician who worked on probability theory. He is best known for the Bonferroni inequalities (a generalization of the union bound) and the Bonferroni correction in statistics. However, although his inequalities can be used to derive the Bonferroni correction, the correction itself was not used until the later work of Dunn in the 1960s.

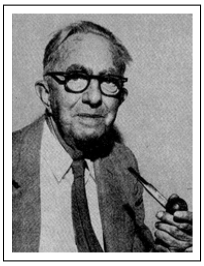
Quelle: Wikipedia

Jerzy Neyman

*1937* **Konfidenzintervalle**

Jerzy Neyman discovered the confidence interval and co-developed the Neyman–Pearson lemma. He introduced the confidence interval in his paper in 1937.

Quelle: Wikipedia

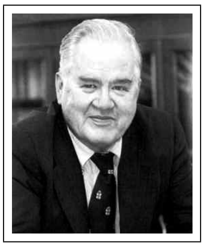


Frank Wilcoxon

*1945* **Wilcoxon-Rangsummentest (Mann-Whitney-U-Test)**

Der Wilcoxon-Mann-Whitney-Test (auch: „Mann-Whitney-U-Test“, „U-Test“, „Wilcoxon-Rangsummentest“) ist ein parameterfreier statistischer Test. Er dient zur Überprüfung der Signifikanz der Übereinstimmung zweier Verteilungen, also ob zwei Verteilungen A und B (zum Beispiel eine unbeeinflusste und eine beeinflusste) zu derselben Grundgesamtheit gehören. Der Test wurde von Frank Wilcoxon (1945) sowie Henry Mann und Donald Whitney (1947) entwickelt.

Quelle: Wikipedia



John Tukey

*1960er* **Box-Plot, paarweise Vergleiche**

Three of Tukey's specific contributions are the Box-and-Whisker Plot, the Stem-and-Leaf Diagram, and Tukey's Paired Comparisons. Box-and-Whisker Plots were invented by Tukey as a means to display groups of data. Typically, five values from a set of data are used; the extremes, the upper and lower hinges (quartiles), and the median.

Quelle: UMM Statistics