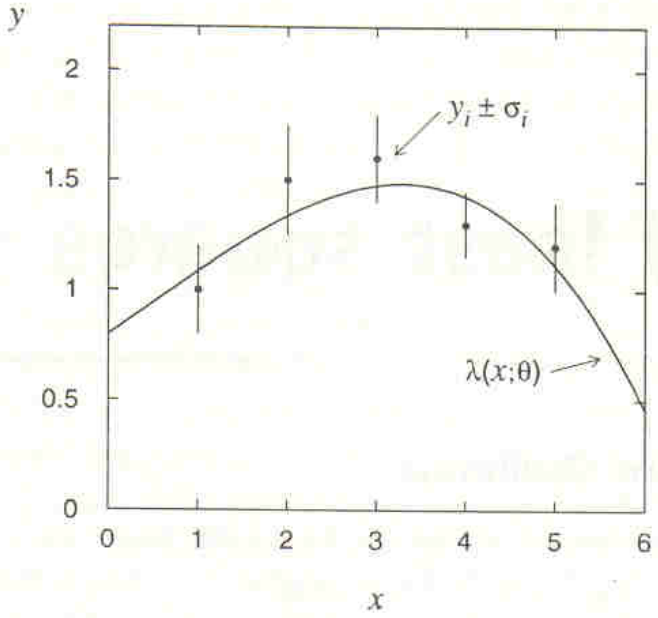


**Fig. 7.1** Ingredients of the least squares problem: $N$ values $y_1, \ldots, y_N$ are measured with errors $\sigma_1, \ldots, \sigma_N$ at the values of $x$ given without error by $x_1, \ldots, x_N$. The true value $\lambda_i$ of $y_i$ is assumed to be given by a function $\lambda_i = \lambda(x_i;\theta)$. The value of $\theta$ is adjusted to minimize the value of $\chi^2$ given by equation (7.3).

- aus G. Cowan  Statistical Data Analysis

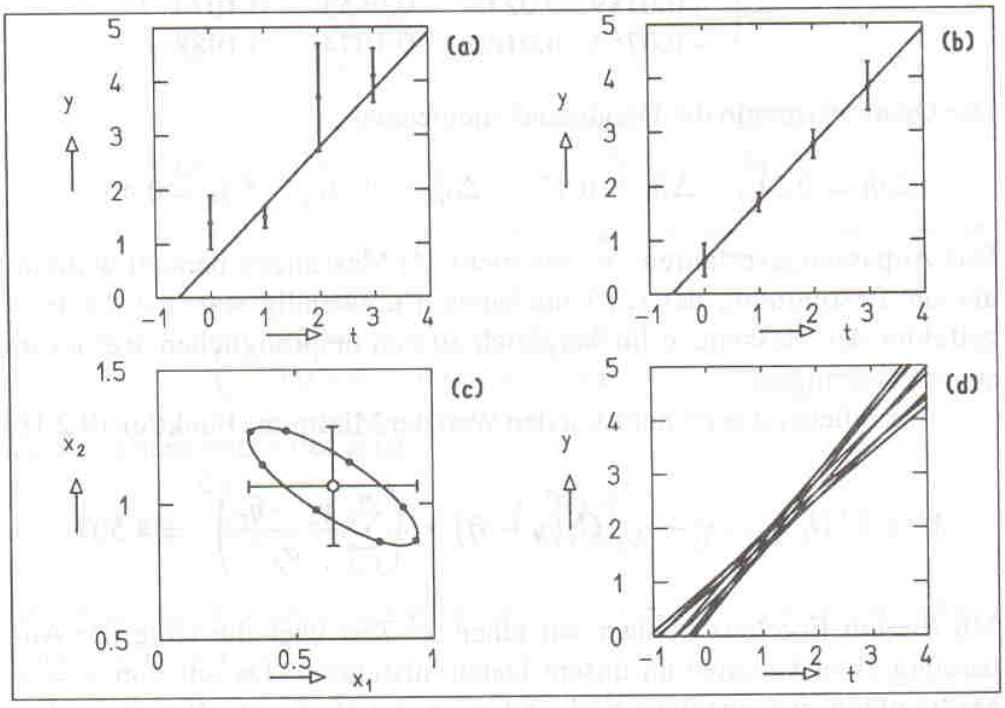


**Bild 9.2:** Anpassung einer Geraden an die Daten aus Tafel 9.2. (a) Ursprüngliche Meßwerte und Fehler, (b) ausgeglichene Meßwerte und Restfehler, (c) Kovarianzellipse der angepaßten Größen $x_1$, $x_2$, (d) Verschiedene Geraden, die einzelnen Punkten der Kovarianzellipse entsprechen.

- aus S. Brandt  Datenanalyse

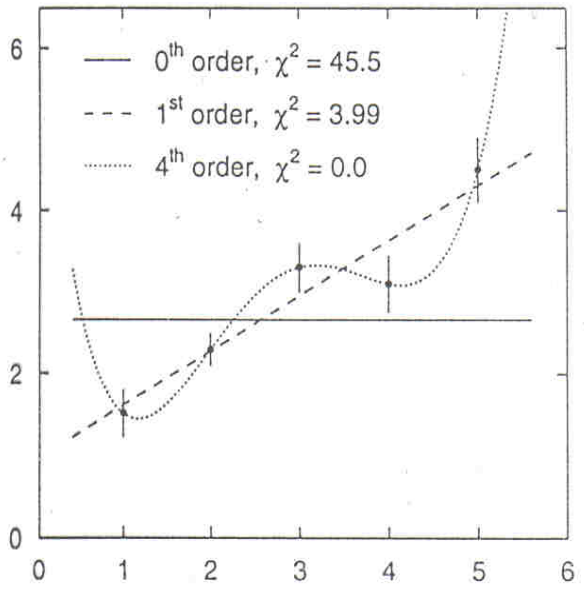


Fig. 7.2 Least squares fits of polynomials of order 0, 1 and 4 to five measured values.

- aus G. Cowan Statistical Data Analysis

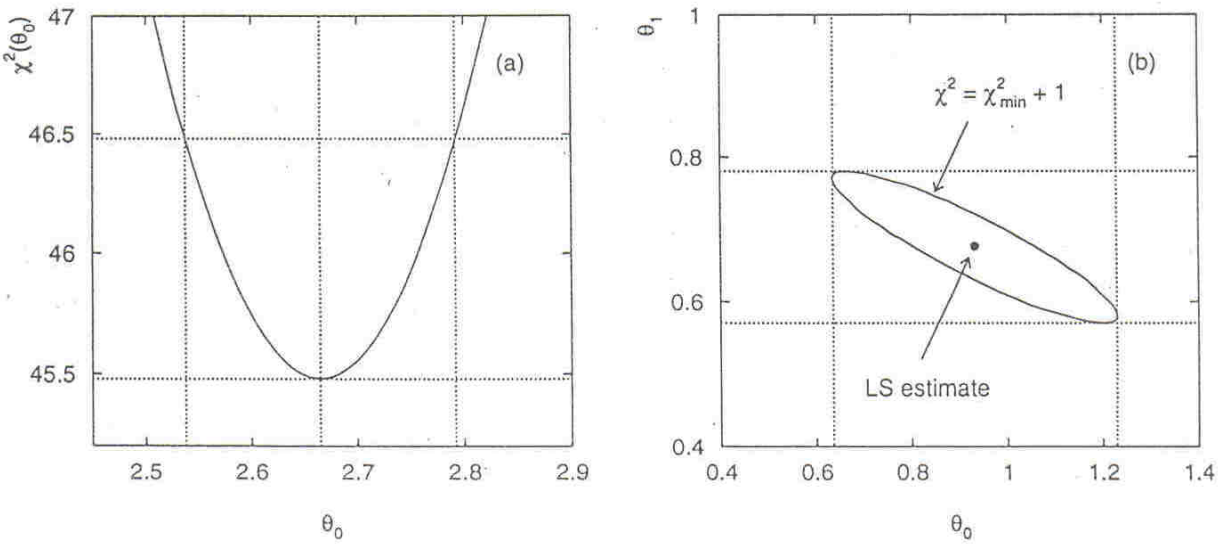


Fig. 7.3 (a) The $\chi^2$ as a function of $\theta_0$ for the zero-order polynomial fit shown in Fig. 7.2. The horizontal lines indicate $\chi^2_{\min}$ and $\chi^2_{\min}+1$. The corresponding $\theta_0$ values (vertical lines) are the LS estimate $\hat{\theta}_0$ and $\hat{\theta}_0 \pm \hat{\sigma}_{\hat{\theta}_0}$. (b) The LS estimates $\hat{\theta}_0$ and $\hat{\theta}_1$ for the first-order polynomial fit in Fig. 7.2. The tangents to the contour $\chi^2(\hat{\theta}_0, \hat{\theta}_1) = \chi^2_{\min} + 1$ correspond to $\hat{\theta}_0 \pm \hat{\sigma}_{\hat{\theta}_0}$ and $\hat{\theta}_1 \pm \hat{\sigma}_{\hat{\theta}_1}$.

- aus G. Cowan Statistical Data Analysis