where the central values are for a Higgs mass of 300 GeV, and the second error bars are for $M_H \to 1000(+)$ or $60(-)$ GeV. In all fits, the errors include full statistical, systematic, and theoretical uncertainties. The $\widehat{s}^2_Z$ error is dominated by m_t, and $\widehat{s}^2_Z$ and m_t have a strong negative correlation of ~ -0.85. In the on-shell scheme one has $s^2_W = 0.2247 \pm 0.0019$, the larger error due to the stronger sensitivity to m_t. The extracted value of α_s is based on a formula which has almost no theoretical uncertainty, and is in excellent agreement with the values 0.121 ± 0.006 from jet-event shapes, at the Z pole, and 0.116 ± 0.005 extracted from low-energy and jet data (see the section on Quantum Chromodynamics). Including the latter value as a separate constraint in the fits has negligible effect on $\sin^2\theta_W$ and m_t.

The value of m_t predicted by the precision data is in remarkable agreement with the value $m_t = 174 \pm 16$ GeV suggested by the CDF candidate top events. (The indirect prediction is for the pole mass, which should correspond approximately to the kinematic mass extracted from the CDF events.) One can carry out a combined fit of the indirect and direct (CDF) data, with the result $m_t = 172^{+11+8}_{-12-9}$ GeV, with little change in the $\sin^2\theta_W$ and α_s values. The results of fits to various combinations of the data are shown in Table 26.5 of the full *Review* and the relation between $\widehat{s}^2_Z$ and m_t for various observables in Fig. 26.1.

The data indicate a preference for a small Higgs mass. This is because there is a strong correlation between the quadratic ρ_t terms and logarithmic M_H effects in all of the indirect data except the $Z \to b\bar{b}$ vertex. The latter favor a smaller m_t and therefore a smaller M_H. The difference in χ^2 for the global fit is $\Delta\chi^2 = \chi^2(M_H = 1000 \text{ GeV}) - \chi^2(M_H = 60 \text{ GeV}) = 2.9$. However, this sensitivity is reduced to $\Delta\chi^2 \sim 2.1$ when the direct CDF value of m_t is included. Hence, the data favor a small value of M_H, as in supersymmetric extensions of the Standard Model, and m_t on the lower side of the allowed range; but the effect is marginal statistically: including the direct constraint $M_H \geq 60$ GeV, the best fit is for $M_H = 60$ GeV, with the weak limit $M_H < 840$ GeV at 90% CL. The value of $\widehat{s}^2_Z = 0.2319 \pm 0.0005$ is in striking agreement with the prediction 0.233 ± 0.003 of grand unified theories based on the minimal supersymmetric extension of the Standard Model, but disagrees with the prediction 0.210 ± 0.003 of nonsupersymmetric unified theories.

One can also determine the radiative correction (to M_W) parameters Δr: including the CDF data, one obtains $\Delta r = 0.040 \pm 0.004$ and $\Delta\widehat{r}_W = 0.068 \pm 0.003$, where the error includes m_t and M_H, in excellent agreement with the predictions 0.041 ± 0.007 and 0.0705 ± 0.0003.